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FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES FISCAL YEAR 1960-61

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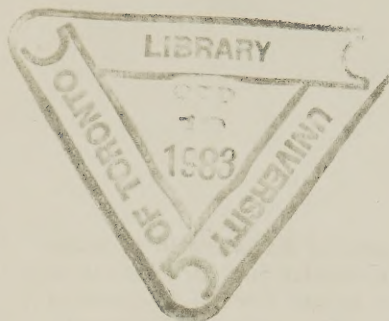
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FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES FISCAL YEAR 1960-61

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PREFACE

This publication, prepared by the Dominion Bureau of Statistics in cooperation with the National Research Council, presents in tabular form an estimate of the magnitude of the scientific activities undertaken by the Federal Government in 1961 and provides an indication of the relative size of the 1962 program.

It covers data in terms of total expenditure in scientific activities, the organizations performing the work, the various scientific fields covered and the number of professional and technical personnel involved in research-development.

The concepts and definitions as well as the questionnaire were prepared following the advice and consultations of senior officials and scientists of the National Research Council and other departments. Questionnaires sent were such that they embraced all Federal Government costs on all scientific activities including those performed by other organizations. In addition, they included payment of salaries made to professional and non-professional personnel, other direct costs and an estimated share of overhead costs. The scientific activities included the conduct of research and development, including planning and administering of research-development; capital expenditures on research-development plant, scientific data collection; scientific information and scholarship and fellowship programs.

The assistance of the Federal Government Departments and agencies who have cooperated by submitting reports is gratefully acknowledged.

September, 1962.

WALTER E. DUFFETT,
Dominion Statistician.

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FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES

FISCAL YEARS 1960-61-1961-62

MILLIONS
OF
DOLLARS



ALL DEPARTMENTS
AND AGENCIES

ALL DEPARTMENTS AND AGENCIES
EXCLUDING ARMED FORCES
INCLUDING DEFENCE RESEARCH BOARD

ALL DEPARTMENTS AND AGENCIES
EXCLUDING ARMED FORCES
AND DEFENCE RESEARCH BOARD

OTHER SCIENTIFIC
ACTIVITIES

CAPITAL EXPENDITURES ON
RESEARCH-DEVELOPMENT
PLANT

CONDUCT OF
RESEARCH-DEVELOPMENT,
INCLUDING PLANNING
AND ADMINISTERING OF
RESEARCH-DEVELOPMENT

1960-61
1961-62

1960-61
1961-62

1960-61
1961-62

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1960-61

During the fiscal year 1961-62, the federal government, including all departments and agencies, budgeted for an outlay of \$258.9 million for scientific activities. This amount represents an increase of 13.2% or \$30.1 million over the \$228.8 million spent in the previous fiscal year. The data for the years 1961-62 and 1959-60 were based on the annual departmental estimates presented to parliament, and

are therefore intentions rather than final expenditures and are subject, to some extent, to postponements and cancellations of certain aspects of the program which may cause actual expenditures to fall somewhat short of the figures published. Data for the other two fiscal years however, are actual expenditures made by the department and are therefore considered to be correct expenditures.

Federal Government Expenditures on Scientific Activities

Scientific activities	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Conduct of research-development including planning and administering research-development.....	168.4	151.8	171.9	192.7
Capital expenditures on research-development plant	30.7	33.0	34.2	37.0
Scientific data collection	18.1	20.6	15.7	21.1
Scientific information	4.1	4.9	5.0	5.6
Scholarship and fellowship programs	1.3	2.0	2.0	2.5
Totals, scientific activities	222.6	212.3	228.8	258.9

The level of the federal government scientific activities decreased slightly in the fiscal year 1959-60; a year of readjustment in government scientific research, following a major change in Canada's aircraft developmental program. The level of expenditures in 1959-60 declined to \$212.3 million, a drop of 4.6% from the \$222.6 million of the previous

year. This program was expanded to a new level in 1960-61 of \$228.8 million, a 7.8% increase over the previous year. A further increase of 13.2% is expected in the fiscal year 1961-62 bringing the level of federal government scientific activity to \$258.9 million.

Federal Government Expenditures on Scientific Activities

Department or agency	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Agriculture.....	27.2	31.1	28.4	31.7
Atomic Energy.....	27.9	32.8	39.9	40.7
Mines and Technical Surveys	27.1	27.7	29.5	39.9
National Research Council	27.2	32.8	36.6	40.1
National Defence	66.2	34.0	31.0	32.1
Defence Research Board	29.3	30.6	31.9	34.7
Other departments	17.7	23.3	31.5	39.7
Totals, all departments and agencies	222.6	212.3	228.8	258.9

Six of the federal government departments and agencies continue to account for a large part of all scientific activity in the federal government, 85% in 1961-62, although this percentage has decreased from 92% in the fiscal year 1958-59, indicating growth in scientific activities in departments that have been less active in past years. Much of the increase in research in these departments has been in the fields of forestry and fishing.

The Department of Agriculture and the Defence Research Board have increased expenditures between 1958-59 and 1961-62 fiscal years by 17% and 18% respectively, Department of National Defence has decreased by 52%. The other three organizations active in scientific research increased their spending by nearly 50% between 1958-59 and 1961-62; Atomic Energy Commission + 45%, Mines and Technical Surveys + 47% and National Research Council + 48%.

Federal Government Expenditures on Scientific Activities, Fiscal Years 1960-61 and 1961-62

Scientific activities	All departments and agencies excluding armed forces and D.R.B.		Department of National Defence and the Defence Research Board		Total all departments and agencies	
	1960-61	1961-62	1960-61	1961-62	1960-61	1961-62
millions of dollars						
Conduct of research-development:						
Conduct of research-development including planning and administering research development ¹	112.7	129.7	59.2	63.0	171.9	192.7
Capital expenditures on research-development plant	32.4	35.5	1.8	1.5	34.2	37.0
Other scientific activities:						
Scientific data collection	13.8	18.7	1.9	2.4	15.7	21.1
Scientific information	5.0	5.6	—	—	5.0	5.6
Scholarship and fellowship programs	2.0	2.5	—	—	2.0	2.5
Totals, scientific activities	165.9	192.1	62.9	66.8	228.8	258.9
Per cent						
Conduct of research-development:						
Conduct of research-development including planning and administering research-development ¹	68.0	67.5	94.1	94.2	75.1	74.4
Capital expenditures on research-development plant	19.5	18.5	2.9	2.2	14.9	14.3
Other scientific activities:						
Scientific data collection	8.3	9.8	3.0	3.6	6.9	8.1
Scientific information	3.0	2.9	—	—	2.2	2.2
Scholarship and fellowship programs	1.2	1.3	—	—	0.9	1.0
Totals, scientific activities	100.0	100.0	100.0	100.0	100.0	100.0

¹ Includes grants-in-aid of research

The civilian branches of government (excluding the armed forces and the Defence Research Board) expected to spend \$192.1 million on scientific activities during the fiscal year 1961-62, an increase of \$26.2 million from the previous year and an increase of 51.3% from the level of 1958-59 of \$127.0 million. In 1961-62 the civilian branches of

government would account for 74.2% of all research-development expenditures of the federal government departments and agencies. This percentage compares with 72.5%, 69.6% and 57.1% for the three previous fiscal years, 1960-61, 1959-60 and 1958-59 respectively.

Funds for the Conduct of Research-Development

Approximately three-quarters of federal government funds for scientific activities is directed to the conduct of research-development. Conduct of research-development as used in this report includes the planning and administering of research and grants-in-aid of research, unless otherwise noted.

Departments and agencies expected to spend, during the fiscal year 1961-62, \$192.7 million for the conduct of research-development, an anticipated 12.1% increase from the \$171.9 million spent during the previous fiscal year and 26.9% increase from the \$151.8 million spent during 1959-60 fiscal year.

Conduct of Research-Development in Government Facilities

	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Total conduct of research-development expenditures	168.4	151.8	171.9	192.7
Research-development performed in government facilities	111.1	119.5	138.6	154.4
Percent of total research-development performed in government facilities.....%	66.0	78.7	80.6	80.1

During the 1958-59 fiscal year, 66.0% of the research-development program was carried out within government facilities. The remainder was contracted to private organizations and used in universities as grants-in-aid of research. The importance of private research-development work for the

federal government has declined in recent years and in the fiscal year 1961-62, 80.1% of all scientific research-development was carried out in government facilities. Profit organizations carried out \$20.8 million of research-development for the federal government in 1961-62.

Payments to Profit Organizations for Research-Development

Department or agency making payment	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Atomic Energy	0.4	1.9	3.7	5.6
Defence Production.....	0.4	2.8	2.9	5.5
National Defence.....	46.3	14.2	8.6	7.4
Defence Research Board	1.5	1.2	1.6	2.0
Other departments	0.1	1.1	0.8	0.3
Totals	48.7	21.2	17.6	20.8

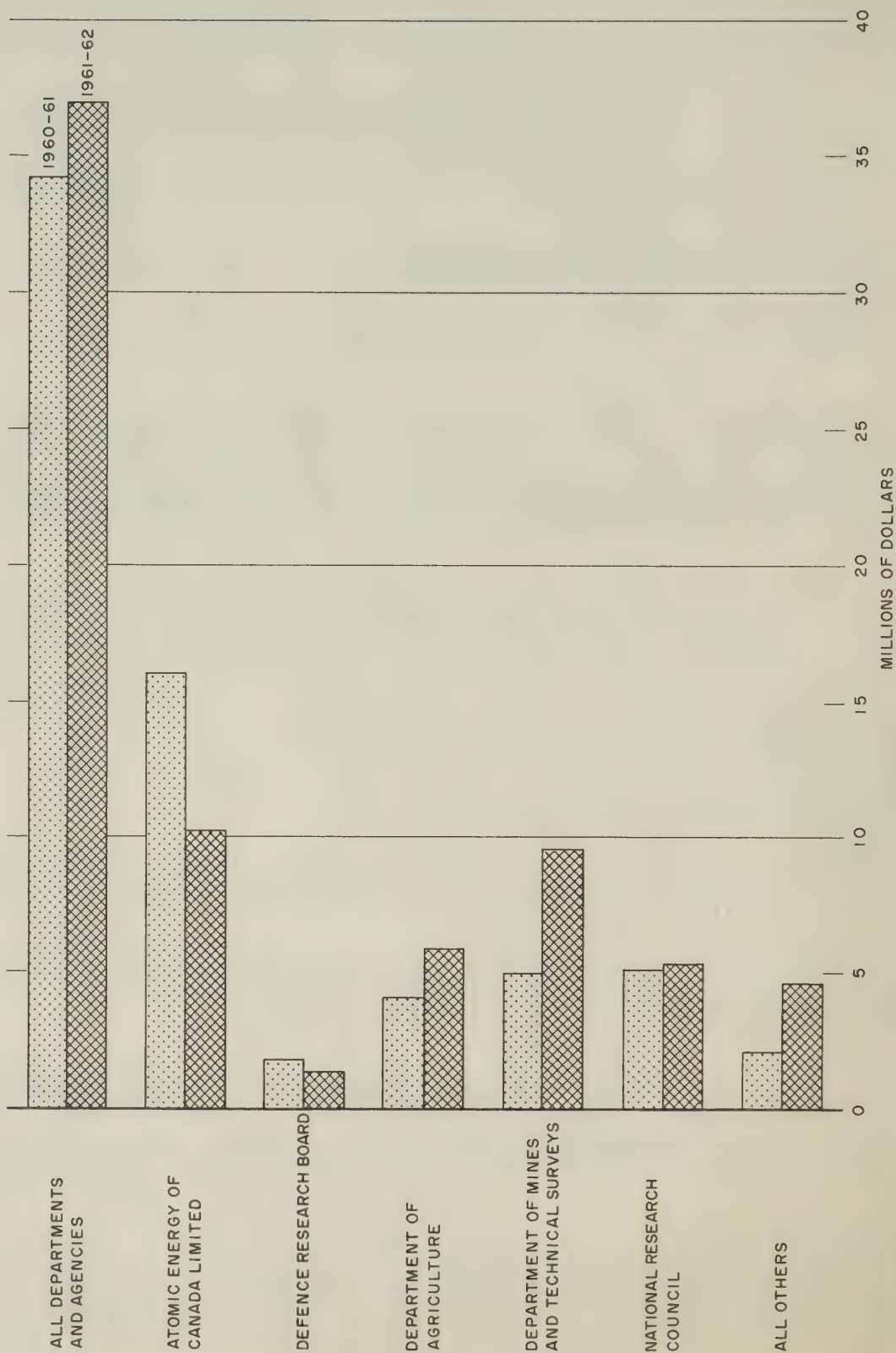
Payments to educational institutions, largely as grants-in-aid of research, increased from \$7.8 million in 1958-59 to \$14.1 million in 1961-62,

an increase of 80.8% between the two periods. Most of these payments are made by the National Research Council.

Grants-in-aid in Educational Institutions for Research-Development

Department or agency making payment	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Atomic Energy	0.4	0.6	0.7	0.8
National Health and Welfare.....	1.1	1.5	2.0	2.0
National Research Council.....	4.5	5.9	7.7	9.1
Defence Research Board.....	1.6	1.6	1.7	1.7
Other departments	0.2	0.2	0.4	0.5
Totals	7.8	9.8	12.5	14.1

CAPITAL EXPENDITURES ON RESEARCH-DEVELOPMENT PLANT
FISCAL YEARS 1960-61-1961-62



Capital Expenditures on Research-Development Plant

Capital expenditures on research-development plant include the construction, acquisition, major repairs and alterations of plant and equipment used

in research-development activities. Capital expenditures on research-development plant for the fiscal year 1961-62 are expected to reach \$36.9 million, an increase of \$2.7 million from the previous year.

Capital Expenditures on Research-Development Plant

Department or agency	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Agriculture	5.3	6.7	4.1	5.9
Atomic Energy	10.1	11.7	16.1	10.2
Mines and Technical Surveys	4.1	1.6	5.0	9.5
National Research Council	2.7	4.6	5.1	5.3
Defence Research Board	5.6	6.3	1.8	1.4
Other departments	2.9	2.1	2.1	5.6
Totals	30.7	33.0	34.2	36.9

The Department of Mines and Technical Surveys and Atomic Energy of Canada, continue to account for over 50 percent of all capital outlays in 1961-62 fiscal year, although increases are reported by the Departments of Fisheries, Forestry and Transport. These expenditures represent 14% in 1961-62, of total funds applied for scientific activities. The exclusion of the armed forces does not affect these

figures since the armed forces development is done mainly through contract. These capital expenditures include only federal government facilities. Any expenditures made by an outside organization, for plant and equipment, to carry out a research-development contract for the federal government, would be included in the cost of the contract and not distinguishable by the department.

Capital Expenditures on Research-Development Plant, Fiscal Years 1960-61 and 1961-62

Department or agency	1960-61		1961-62	
	Millions of dollars	Per cent of total	Millions of dollars	Per cent of total
National Research Council	5.1	14.9	5.3	14.4
Atomic Energy	16.1	47.1	10.2	27.6
Agriculture	4.1	12.0	5.9	16.0
Board of Grain Commissioners - Grain Research Laboratory	0.1	0.3	-	-
External Affairs	-	-	-	-
Central Mortgage and Housing Corporation	-	-	-	-
Fisheries	0.4	1.2	1.0	2.7
Fisheries Research Board of Canada	0.5	1.4	1.5	4.1
Forestry	0.3	0.9	0.7	1.9
Mines and Technical Surveys	5.0	14.6	9.5	25.7
National Film Board	-	-	-	-
National Health and Welfare	0.2	0.6	0.3	0.8
Northern Affairs and National Resources	0.1	0.3	0.1	0.3
Post Office	-	-	-	-
St. Lawrence Seaway Authority	-	-	-	-
Transport	0.5	1.4	1.0	2.7
Veterans Affairs	-	-	-	-
Defence Production	-	-	-	-
Canadian Arsenals Ltd.	-	-	-	-
Defence Research Board	1.8	5.3	1.4	3.8
Sub-totals	34.2	100.0	36.9	100.0
Armed Forces	-	-	-	-
Grand totals	34.2	100.0	36.9	100.0

Funds for Other Scientific Activities, etc.

Funds for other scientific activities, including scientific data collection, scientific information and scholarship and fellowship programs, amounted to

\$29.2 million during the fiscal year 1961-62 an increase of 28.6% from the \$22.7 million spent in the previous year.

Funds for Other Scientific Activities

	1958-59	1959-60	1960-61	1961-62
	millions of dollars			
Scientific data collection	18.1	20.6	15.7	21.1
Scientific information	4.1	4.9	5.0	5.6
Scholarship and Fellowship programs	1.3	2.0	2.0	2.5
Totals	23.5	27.5	22.7	29.2

Scientific data collection expenditures amounted to \$15.7 million during 1960-61 and were expected to reach \$21.1 million for the fiscal year 1961-62. Scientific data collection includes the collection of scientific data on natural phenomena where such data have general use such as for mapping, collection of geologic, hydrologic, geo-magnetic and other physical data, collection of entomological specimens and other biological data. Excluded are data collection done in the course of carrying out a specific research-development project or program as this activity is included under the conduct of research-development.

Scientific information amounted to \$5.0 million and \$5.6 million during the two fiscal years 1960-61 and 1961-62 and includes library operations, translation, procurement and publication services in connection with information required in or resulting from scientific activities. Also included are expenditures for the standardization of terminology and the making of scientific or technical glossaries.

The scholarship and fellowship programs include the costs of scholarships and fellowships granted to governmental and non-governmental recipients who are or will be engaged in a scientific activity, and the administration costs of these programs.

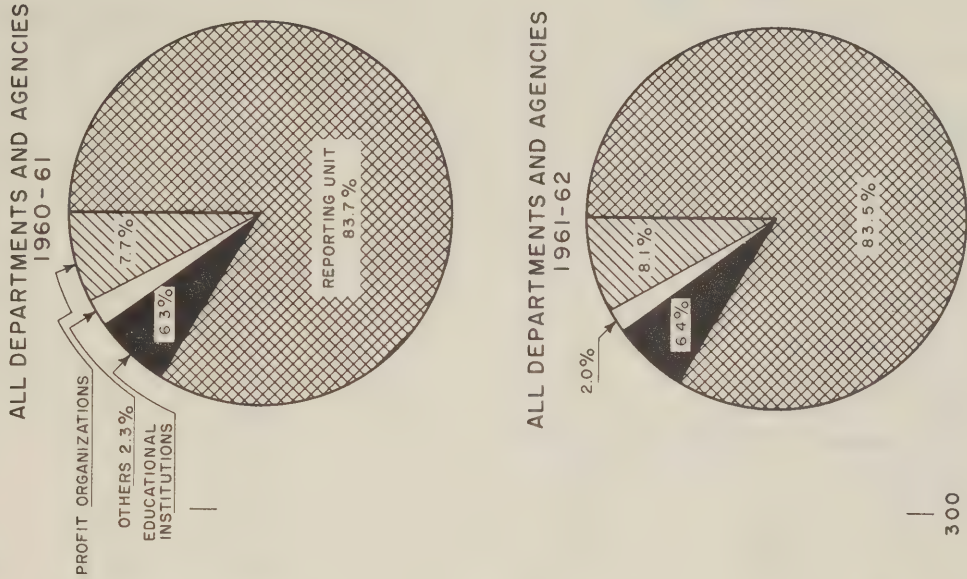
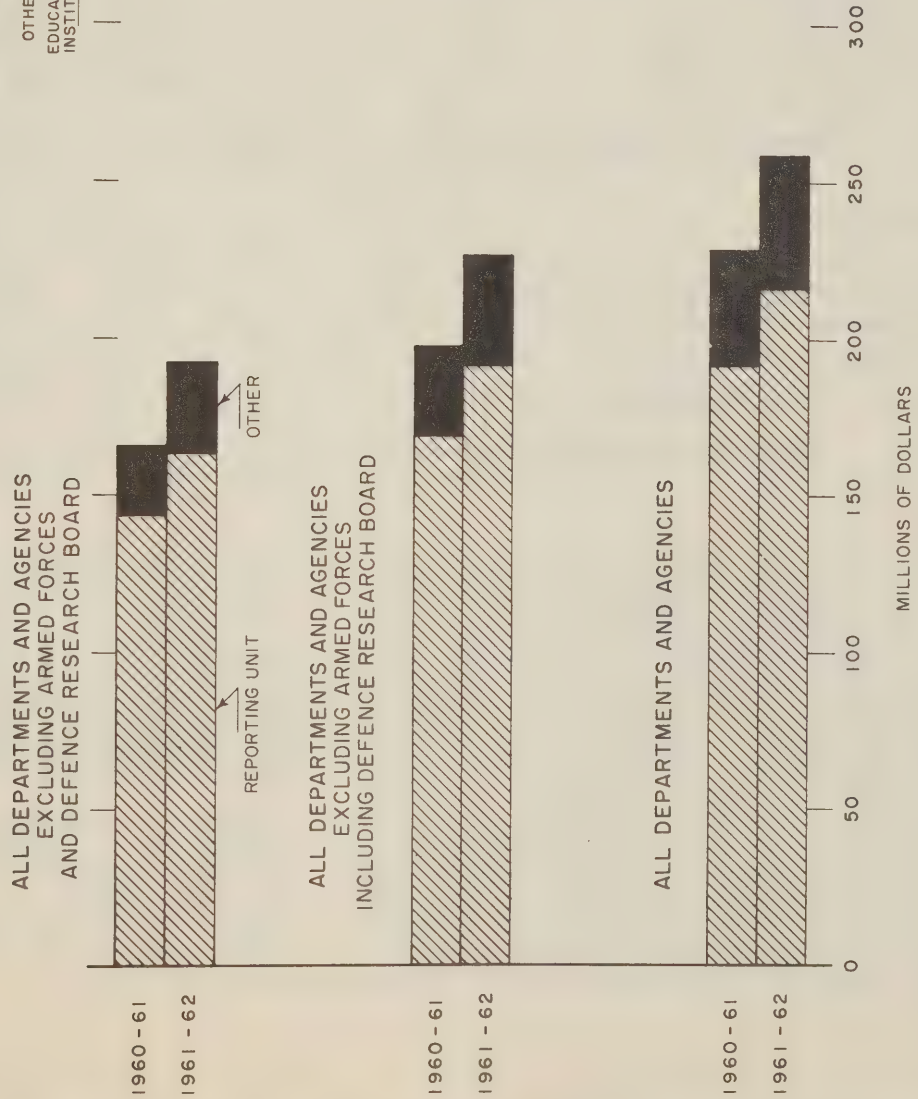
Scientific Fields of Research-Development

The federal government expenditures on the conduct of research-development including planning and administering of research-development and grants-in-aid of research in universities amounted to \$111.7 million in the fiscal year 1960-61 and \$128.9 million in 1961-62 (Excluding the Department of National Defence and the Defence Research Board). During the two fiscal years, more than 50% of all research-development was carried out in the physical sciences, 57.2 per cent in 1960-61 and 59.7 per cent in 1961-62, and the remainder in the life sciences.

Federal Government Expenditures on the Conduct of Research-Development by Scientific Fields (Excluding the Armed Forces and Defence Research Board) Fiscal Years 1960-61 and 1961-62

Scientific field	1960-61		1961-62	
	Millions of dollars	Per cent	Millions of dollars	Per cent
Physical sciences	63.9	57.2	76.9	59.7
Life sciences	47.8	42.8	52.0	40.3
Totals	111.7	100.0	128.9	100.0

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES BY TYPE OF ORGANIZATION PERFORMING RESEARCH FISCAL YEARS 1960-61 AND 1961-62



Federal Government Expenditures on Research-Development, by Scientific Fields (Excluding the Armed Forces and the Defence Research Board), Fiscal Years 1958-59 to 1961-62 Inclusive

Scientific fields	1958-59	1959-60	1960-61	1961-62
millions of dollars				
Physical sciences:				
1. Engineering:				
Chemical	3.5	4.4	5.1	6.3
Civil	2.3	2.6	3.4	3.8
Electrical	4.8	5.9	7.4	8.9
Mechanical	8.1	9.6	12.1	13.7
Other	1.7	4.9	5.2	7.7
Sub-totals	20.4	27.4	33.2	40.4
2. Other physical sciences:				
Chemistry	6.4	7.3	8.6	9.8
Physics	7.0	8.2	7.6	9.1
Geology, geophysics and other earth sciences	4.1	4.3	9.4	11.2
Metallurgy	4.9	5.3	2.6	3.4
Mathematics	0.1	0.1	0.4	0.4
Other physical sciences	2.6	2.8	2.1	2.6
Sub-totals	25.1	28.0	30.7	36.5
Totals, physical sciences	45.5	55.4	63.9	76.9
Life sciences:				
Medicine	4.5	5.9	8.1	8.8
Agriculture	23.0	25.4	26.0	27.7
Biology	7.8	9.1	13.2	15.0
Other	—	—	0.5	0.5
Totals, life sciences	35.3	40.4	47.8	52.0
Totals, life and physical sciences	80.8	95.8	111.7	128.9

Increases have occurred in the civilian departments, excluding the Department of National Defence and the Defence Research Board, in expenditures for research-development in most scientific fields between the fiscal years 1958-59 and 1961-62. In the engineering fields, expenditures have increased from \$20.4 million in 1958-59 to \$40.4 million in 1961-62, an increase of 100 per cent. The increase in research-development expenditures in fields of physical sciences, other than engineering, has been from \$25.1 million in 1958-59 to \$36.5 million in 1961-62, an increase of 46 per cent. Expenditures in the field of geology, geophysics and other earth sciences have increased substantially from \$4.1 million in 1958-59 to \$11.2 million in 1961-62, while at the same time expenditures in the field of

metallurgy have declined slightly from \$4.9 million to \$3.4 million over the same period.

Expenditures for research-development in the physical sciences have been increasing approximately \$10 million each year since 1958-59 fiscal year with expenditures of \$45.5 million in 1958-59, \$55.4 million in 1959-60, \$63.9 million in 1960-61 and \$76.9 million in 1961-62.

Research-development expenditures in the life sciences have increased in proportion to total research-development from \$35.3 million in 1958-59 to \$52.0 million in 1961-62 with much of the increase being in the field of biology, which increased from \$7.8 million in 1958-59 to \$15.0 million in 1961-62.

STATISTICAL TABLES

**TABLE 1. Federal Government Expenditures on Scientific Activities, by Activity and Performing Organization
Fiscal Years 1960 - 61 and 1961 - 62**

Scientific activity	1960-61						1961-62					
	Performing organization					Total funds applied	Performing organization					Total funds applied
	Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Others		Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Others	
	thousands of dollars											
Scientific research-development:												
Total conduct of research-development including planning and administering research-development	138,588	17,570	252	475	1,391	158,276	154,471	20,767	363	337	1,486	177,424
Grants-in-aid of research	5	—	12,228	1,218	138	13,589	5	—	13,688	1,401	203	15,297
Sub-totals	138,593	17,570	12,480	1,693	1,529	171,865	154,476	20,767	14,051	1,738	1,689	192,721
Capital expenditures on research-development plant	32,351	15	45	25	1,786	34,222	35,414	10	100	17	1,443	36,984
Totals, scientific research-development	170,944	17,585	12,525	1,718	3,315	206,087	189,890	20,777	14,151	1,755	3,132	229,705
Other scientific activities:												
Scientific data collection	15,377	55	240	—	33	15,705	20,547	200	326	—	33	21,106
Scientific information	4,906	—	—	88	42	5,036	5,465	—	—	126	32	5,623
Scholarship and fellowship programs	290	—	1,656	—	74	2,020	318	—	2,020	—	120	2,458
Sub-totals	20,573	55	1,896	88	149	22,761	26,330	200	2,346	126	185	29,187
Totals, funds applied	191,517	17,640	14,421	1,806	3,464	228,848	216,220	20,977	16,497	1,881	3,317	258,892

**TABLE 2. Federal Government Expenditures on Scientific Activities, by Activity and Performing Organization
(Excluding Armed Forces and D.R.B.) Fiscal Years 1960 - 61 and 1961 - 62**

Scientific activity component	1960 - 61						1961 - 62					
	Performing organization					Total funds applied	Performing organization					Total funds applied
	Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Others		Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Others	
	thousands of dollars											
Scientific research-development:												
Total conduct of research-development including planning and administering research-development	92,439	7,392	252	475	247	100,805	103,667	11,404	363	337	302	116,073
Grants-in-aid of research	5	—	10,533	1,218	138	11,894	5	—	11,998	1,401	203	13,607
Sub-totals	92,444	7,392	10,785	1,693	385	112,699	103,672	11,404	12,361	1,738	505	129,680
Capital expenditures on research-development plant	32,351	15	45	25	—	32,436	35,414	10	100	17	—	35,541
Totals, scientific research-development	124,795	7,407	10,830	1,718	385	145,135	139,086	11,414	12,461	1,755	505	165,221
Other scientific activities:												
Scientific data collection	13,423	55	240	—	33	13,751	18,192	200	326	—	33	18,751
Scientific information	4,906	—	—	88	42	5,036	5,465	—	—	126	32	5,623
Scholarship and fellowship programs	290	—	1,656	—	74	2,020	318	—	2,020	—	120	2,458
Sub-totals	18,619	55	1,896	88	149	20,807	23,975	200	2,346	126	185	26,832
Totals, funds applied	143,414	7,462	12,726	1,806	534	165,942	163,061	11,614	14,807	1,881	690	192,053

TABLE 3 A. Federal Government Expenditures on Scientific Activities, by Activity and Department or Agency, Fiscal Year 1960-61

Department or agency	Scientific research-development				Total scientific research-development	Other scientific activities				Total funds applied
	Conduct of research-development	Grants-in-aid of research	Sub-total	Capital expenditures on research-development plant		Scientific data collection	Scientific information	Scholarship and fellowship programs	Sub-total	
thousands of dollars										
National Research Council	20,687	7,657	28,344	5,083	33,427	55	1,215	1,878	3,148	36,575
Atomic Energy:										
Atomic Energy Control Board	—	650	650	—	650	—	—	—	—	650
Atomic Energy of Canada Limited	23,056	—	23,056	16,120	39,176	—	—	42	42	39,218
Sub-totals	23,056	650	23,706	16,120	39,826	—	—	42	42	39,868
Agriculture:										
Administration Branch	—	—	—	—	—	—	401	—	401	401
Production and Marketing Branch—Health of Animals Division	422	—	422	26	448	—	14	—	14	462
Research Branch	22,996	136	23,132	4,032	27,164	—	378	—	378	27,542
Sub-totals	23,418	136	23,554	4,058	27,612	—	793	—	793	28,405
Board of Grain Commissioners—Grain Research Laboratory	130	—	130	84	214	166	30	—	196	410
External Affairs	—	54	54	—	54	—	—	74	74	128
Central Mortgage and Housing Corporation	—	76	76	—	76	—	2	—	2	78
Fisheries:										
Conservation and Development Service	411	—	411	340	751	—	—	—	—	751
Inspection Service	6	—	6	—	6	5	—	—	5	11
Industrial Development Service	353	59	412	30	442	—	—	—	—	442
Sub-totals	770	59	829	370	1,199	5	—	—	5	1,204
Fisheries Research Board of Canada	4,860	—	4,860	501	5,361	—	66	26	92	5,453
Forestry:										
Forest Entomology and Pathology Branch	4,119	23	4,142	330	4,472	—	—	—	—	4,472
Forest Research Branch	2,847	—	2,847	—	2,847	—	—	—	—	2,847
Forest Products Research Branch	1,300	—	1,300	11	1,311	—	—	—	—	1,311
Sub-totals	8,266	23	8,289	341	8,630	—	—	—	—	8,630
Mines and Technical Surveys:										
Dominion Observatories Branch	2,446	—	2,446	—	2,446	—	—	—	—	2,446
Geographical Branch	402	4	406	7	413	—	64	—	64	477
Geological Survey of Canada Branch	2,850	50	2,900	270	3,170	1,318	412	—	1,730	4,900
Mines Branch	4,916	—	4,916	388	5,304	108	59	—	167	5,471
Polar Continental Shelf Project	57	—	57	155	212	1,234	2	—	1,236	1,448
Surveys and Mapping Branch	—	—	—	4,179	4,179	8,617	1,981	—	10,598	14,777
Sub-totals	10,671	54	10,725	4,999	15,724	11,277	2,518	—	13,795	29,519
National Film Board	29	—	29	1	30	—	—	—	—	30
National Health and Welfare	1,643	3,170	4,813	232	5,045	402	54	—	456	5,501
Northern Affairs and National Resources:										
National Parks Branch	743	—	743	—	743	—	12	—	12	755
National Museum of Canada	120	—	120	—	120	240	—	—	240	360
Northern Co-ordination and Research Centre	24	15	39	—	39	—	—	—	—	39
Water Resources Branch	765	—	765	122	887	1,287	226	—	1,513	2,400
Sub-totals	1,652	15	1,667	122	1,789	1,527	238	—	1,765	3,554
Post Office-Engineering and Development Branch	653	—	653	—	653	—	—	—	—	653
St. Lawrence Seaway Authority	20	—	20	—	20	—	—	—	—	20
Transport:										
Air Services:										
Meteorological Branch	385	—	385	140	525	319	5	—	324	849
Telecommunications and Electronics Branch	223	—	223	385	608	—	112	—	112	720
Marine Services:										
Marine Works Branch	—	—	—	—	—	—	—	—	—	—
Shipbuilding Branch	52	—	52	—	52	—	—	—	—	52
Sub-totals	660	—	660	525	1,185	319	117	—	436	1,621
Veterans Affairs	354	—	354	—	354	—	3	—	3	357
Defence Production	2,902	—	2,902	—	2,902	—	—	—	—	2,902
Canadian Arsenals Ltd.	1,034	—	1,034	—	1,034	—	—	—	—	1,034
Totals	100,805	11,894	112,699	32,436	145,135	13,751	5,036	2,020	20,807	165,942
National Defence (excluding Defence Research Board)	29,075	—	29,075	—	29,075	1,954	—	—	1,954	31,029
Defence Research Board	28,396	1,695	30,091	1,786	31,877	—	—	—	—	31,877
Totals, all departments and agencies	158,276	13,589	171,865	34,222	206,087	15,705	5,036	2,020	22,761	228,848

TABLE 3B. Federal Government Expenditures on Scientific Activities, by Activity and Department or Agency, Fiscal Year 1961-62

Department or agency	Scientific research-development				Total scientific research-development	Other scientific activities				Total funds applied
	Conduct of research-development	Grants-in aid of research	Sub-total	Capital expenditures on research-development plant		Scientific data collection	Scientific information	Scholarship and fellowship programs	Sub-total	
thousands of dollars										
National Research Council	21,881	9,015	30,896	5,271	36,167	200	1,473	2,260	3,933	40,100
Atomic Energy:										
Atomic Energy Board	—	700	700	—	700	—	—	—	—	700
Atomic Energy of Canada Limited	29,706	—	29,706	10,198	39,904	—	—	50	50	39,954
Sub-totals	29,706	700	30,406	10,198	40,604	—	—	50	50	40,654
Agriculture:										
Administration Branch	—	—	—	—	—	—	442	—	442	442
Production and Marketing Branch—Health of Animals Division	593	—	593	895	1,488	—	12	—	12	1,500
Research Branch	24,193	140	24,333	5,016	29,349	—	400	—	400	29,749
Sub-totals	24,786	140	24,926	5,911	30,837	—	854	—	854	31,691
Board of Grain Commissioners—Grain Research Laboratory	165	—	165	49	214	188	33	—	221	435
External Affairs	—	22	22	—	22	—	—	120	120	142
Central Mortgage and Housing Corporation	50	138	188	—	188	—	—	—	—	188
Fisheries:										
Conservation and Development Service	449	—	449	934	1,383	—	—	—	—	1,383
Inspection Service	7	—	7	—	7	7	—	—	7	14
Industrial Development Service	541	113	654	35	689	—	—	—	—	689
Sub-totals	997	113	1,110	969	2,079	7	—	—	7	2,086
Fisheries Research Board of Canada	5,609	23	5,632	1,494	7,126	—	78	28	106	7,232
Forestry:										
Forest Entomology and Pathology Branch	4,697	11	4,708	530	5,238	—	—	—	—	5,238
Forest Research Branch	3,310	—	3,310	218	3,528	—	—	—	—	3,528
Forest Products Research Board	1,545	—	1,545	—	1,545	—	—	—	—	1,545
Sub-totals	9,552	11	9,563	748	10,311	—	—	—	—	10,311
Mines and Technical Surveys:										
Dominion Observatories Branch	2,797	—	2,797	—	2,797	—	—	—	—	2,797
Geographical Branch	454	—	454	11	465	—	113	—	113	578
Geological Survey of Canada Branch	3,289	75	3,364	366	3,730	1,920	450	—	2,370	6,100
Mines Branch	5,341	—	5,341	328	5,669	116	64	—	180	5,849
Polar Continental Shelf Project	32	—	32	202	234	1,569	5	—	1,574	1,808
Surveys and Mapping Branch	—	—	—	8,610	8,610	12,032	2,101	—	14,133	22,743
Sub-totals	11,913	75	11,988	9,517	21,505	15,637	2,733	—	18,370	39,875
National Film Board	30	—	30	2	32	—	—	—	—	32
National Health and Welfare	1,727	3,330	5,057	261	5,318	472	52	—	524	5,842
Northern Affairs and National Resources:										
National Parks Branch	810	—	810	—	810	—	13	—	13	823
National Museum of Canada	163	—	163	—	163	326	—	—	326	489
Northern Co-ordination and Research Centre	37	15	52	—	52	—	—	—	—	52
Water Resources Branch	925	—	925	96	1,021	1,487	262	—	1,749	2,770
Sub-totals	1,935	15	1,950	96	2,046	1,813	275	—	2,088	4,134
Post Office-Engineering and Development Branch	132	—	132	—	132	—	—	—	—	132
St- Lawrence Seaway Authority	—	—	—	—	—	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	452	25	477	300	777	354	5	—	359	1,136
Telecommunications and Electronics Branch	334	—	334	494	828	—	115	—	115	943
Marine Services:										
Marine Works Branch	60	—	60	231	291	80	—	—	80	371
Shipbuilding Branch	47	—	47	—	47	—	—	—	—	47
Sub-totals	893	25	918	1,025	1,943	434	120	—	554	2,497
Veterans Affairs	384	—	384	—	384	—	5	—	5	389
Defence Production	5,500	—	5,500	—	5,500	—	—	—	—	5,500
Canadian Arsenalns Ltd.	813	—	813	—	813	—	—	—	—	813
Totals	116,073	13,607	129,680	35,541	165,221	18,751	5,623	2,458	26,832	192,053
National Defence (excluding Defence Research Board)	29,744	—	29,744	—	29,744	2,355	—	—	2,355	32,099
Defence Research Board	31,607	1,690	33,297	1,443	34,740	—	—	—	—	34,740
Totals, all departments and agencies....	177,424	15,297	192,721	36,984	229,705	21,106	5,623	2,458	29,187	258,892

TABLE 4. Federal Government Expenditures on Scientific Activities, by Performing Organization and Department or Agency Fiscal Years 1960-61 and 1961-62

Department of agency	1960-61					1961-62				
	Performing organization				Total funds applied	Performing organization				Total funds applied
	Reporting unit	Profit organizations	Educational institutions	Others ¹		Reporting unit	Profit organizations	Educational institutions	Others ¹	
	thousands of dollars									
National Research Council	26,603	55	9,380	537	36,575	28,358	200	11,105	437	40,100
Atomic Energy:										
Atomic Energy Control Board	—	—	650	—	650	—	—	700	—	700
Atomic Energy of Canada Limited	35,412	3,743	63	—	39,218	34,253	5,571	130	—	39,954
Sub-totals	35,412	3,743	713	—	39,868	34,253	5,571	830	—	40,654
Agriculture:										
Administration Branch	365	—	—	36	401	416	—	—	26	442
Production and Marketing Branch—Health of Animals Division	462	—	—	—	462	1,500	—	—	—	1,500
Research Branch	27,406	—	136	—	27,542	29,609	—	140	—	29,749
Sub-totals	28,233	—	136	36	28,405	31,525	—	140	26	31,691
Board of Grain Commissioners—Grain Research Laboratory	410	—	—	—	410	435	—	—	—	435
External Affairs	—	—	—	128	128	—	—	—	142	142
Central Mortgage and Housing Corporation	2	—	—	76	78	50	—	—	138	188
Fisheries:										
Conservation and Development Service	751	—	—	—	751	1,383	—	—	—	1,383
Inspection Service	11	—	—	—	11	14	—	—	—	14
Industrial Development Service	312	71	—	59	442	356	220	9	104	689
Sub-totals	1,074	71	—	59	1,204	1,753	220	9	104	2,086
Fisheries Research Board of Canada	5,453	—	—	—	5,453	7,209	—	23	—	7,232
Forestry:										
Forest Entomology and Pathology Branch	4,449	—	23	—	4,472	5,227	—	11	—	5,238
Forest Research Branch	2,847	—	—	—	2,847	3,528	—	—	—	3,528
Forest Products Research Branch	1,311	—	—	—	1,311	1,545	—	—	—	1,545
Sub-totals	8,607	—	23	—	8,630	10,300	—	11	—	10,311
Mines and Technical Surveys:										
Dominion Observations Branch	2,446	—	—	—	2,446	2,797	—	—	—	2,797
Geographical Branch	473	—	4	—	477	578	—	—	—	578
Geological Survey of Canada Branch	4,850	—	50	—	4,900	6,025	—	75	—	6,100
Mines Branch	5,471	—	—	—	5,471	5,849	—	—	—	5,849
Polar Continental Shelf Project	1,412	36	—	—	1,448	1,808	—	—	—	1,808
Surveys and Mapping Branch	14,777	—	—	—	14,777	22,743	—	—	—	22,743
Sub-totals	29,429	36	54	—	29,519	39,800	—	75	—	39,875
National Film Board	30	—	—	—	30	32	—	—	—	32
National Health and Welfare	2,261	—	2,058	1,182	5,501	2,395	—	2,100	1,347	5,842
Northern Affairs and National Resources:										
National Parks Branch	755	—	—	—	755	823	—	—	—	823
National Museum of Canada	—	—	360	—	360	—	—	489	—	489
Northern Co-ordination and Research Centre	29	—	—	10	39	42	—	—	10	52
Water Resources Branch	2,088	—	—	312	2,400	2,403	—	—	367	2,770
Sub-totals	2,872	—	360	322	3,554	3,268	—	489	377	4,134
Post Office-Engineering and Development Branch	50	603	—	—	653	56	76	—	—	132
St. Lawrence Seaway Authority	20	—	—	—	20	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	849	—	—	—	849	1,111	—	25	—	1,136
Telecommunications and Electronics Branch	720	—	—	—	720	943	—	—	—	943
Marine Services:										
Marine Works Branch	—	—	—	—	—	371	—	—	—	371
Shipbuilding Branch	—	52	—	—	52	—	47	—	—	47
Sub-totals	1,569	52	—	—	1,621	2,425	47	25	—	2,497
Veterans Affairs	355	—	2	—	357	389	—	—	—	389
Defence Production	—	2,902	—	—	2,902	—	5,500	—	—	5,500
Canadian Arsenals Ltd.	1,034	—	—	—	1,034	813	—	—	—	813
Totals	143,414	7,462	12,726	2,340	165,942	163,061	11,614	14,807	2,571	192,053
National Defence (excluding Defence Research Board)	22,416	8,613	—	—	31,029	24,605	7,384	—	10	32,099
Defence Research Board	25,687	1,565	1,695	2,930	31,877	28,454	1,979	1,690	2,617	34,740
Totals, all departments and agencies....	191,517	17,640	14,421	5,270	228,848	216,220	20,977	16,497	5,198	258,892

¹ Includes other non-profit organizations and other governments.

TABLE 5. Federal Government Expenditures on Conduct of Research-Development, by Performing Organization and Department or Agency Fiscal Years 1960-61 and 1961-62

Department or agency	1960-61					1961-62				
	Performing organization				Total conduct of research-development ²	Performing organization				Total conduct of research-development ²
	Reporting unit	Profit organizations	Educational institutions	Others ¹		Reporting unit	Profit organizations	Educational institutions	Others ¹	
	thousands of dollars									
National Research Council	20, 145	—	7, 724	475	28, 344	21, 474	—	9, 085	337	30, 896
Atomic Energy:										
Atomic Energy Control Board	—	—	650	—	650	—	—	700	—	700
Atomic Energy of Canada Limited	19, 250	3, 743	63	—	23, 056	24, 005	5, 571	130	—	29, 706
Sub-totals	19, 250	3, 743	713	—	23, 706	24, 005	5, 571	830	—	30, 406
Agriculture:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	422	—	—	—	422	593	—	—	—	593
Research Branch	22, 996	—	136	—	23, 132	24, 193	—	140	—	24, 333
Sub-totals	23, 418	—	136	—	23, 554	24, 786	—	140	—	24, 926
Board of Grain Commissioners—Grain Research Laboratory	130	—	—	—	130	165	—	—	—	165
External Affairs	—	—	—	54	54	—	—	—	22	22
Central Mortgage and Housing Corporation.....	—	—	—	76	76	50	—	—	138	188
Fisheries:										
Conservation and Development Service	411	—	—	—	411	449	—	—	—	449
Inspection Service	6	—	—	—	6	7	—	—	—	7
Industrial Development Service	297	56	—	59	412	331	210	9	104	654
Sub-totals	714	56	—	59	829	787	210	9	104	1, 110
Fisheries Research Board of Canada	4, 860	—	—	—	4, 860	5, 609	—	23	—	5, 632
Forestry:										
Forest Entomology and Pathology Branch	4, 119	—	23	—	4, 142	4, 697	—	11	—	4, 708
Forest Research Branch	2, 847	—	—	—	2, 847	3, 310	—	—	—	3, 310
Forest Products Research Branch	1, 300	—	—	—	1, 300	1, 545	—	—	—	1, 545
Sub-totals	8, 266	—	23	—	8, 289	9, 552	—	11	—	9, 563
Mines and Technical Surveys:										
Dominion Observatories Branch	2, 446	—	—	—	2, 446	2, 797	—	—	—	2, 797
Geographical Branch	402	—	4	—	406	454	—	—	—	454
Geological Survey of Canada Branch	2, 850	—	50	—	2, 900	3, 289	—	75	—	3, 364
Mines Branch	4, 916	—	—	—	4, 916	5, 341	—	—	—	5, 341
Polar Continental Shelf Project	21	36	—	—	57	32	—	—	—	32
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	10, 635	36	54	—	10, 725	11, 913	—	75	—	11, 988
National Film Board	29	—	—	—	29	30	—	—	—	30
National Health and Welfare	1, 643	—	2, 013	1, 157	4, 813	1, 727	—	2, 000	1, 330	5, 057
Northern Affairs and National Resources:										
National Parks Branch	743	—	—	—	743	810	—	—	—	810
National Museum of Canada	—	—	120	—	120	—	—	163	—	163
Northern Co-ordination and Research Centre	29	—	—	10	39	42	—	—	10	52
Water Resources Branch	518	—	—	247	765	623	—	—	302	925
Sub-totals	1, 290	—	120	257	1, 667	1, 475	—	163	312	1, 950
Post Office-Engineering and Development Branch	50	603	—	—	653	56	76	—	—	132
St. Lawrence Seaway Authority	20	—	—	—	20	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	385	—	—	—	385	452	—	25	—	477
Telecommunications and Electronics Branch	223	—	—	—	223	334	—	—	—	334
Marine Services:										
Marine Works Branch	—	—	—	—	—	60	—	—	—	60
Shipbuilding Branch	—	52	—	—	52	—	47	—	—	47
Sub-totals	608	52	—	—	660	846	47	25	—	918
Veterans Affairs	352	—	2	—	354	384	—	—	—	384
Defence Production	—	2, 902	—	—	2, 902	—	5, 500	—	—	5, 500
Canadian Arsenals Ltd.	1, 034	—	—	—	1, 034	813	—	—	—	813
Totals	92, 444	7, 392	10, 785	2, 078	112, 699	103, 672	11, 404	12, 361	2, 243	129, 680
National Defence (excluding Defence Research Board)	20, 462	8, 613	—	—	29, 075	22, 350	7, 384	—	10	29, 744
Defence Research Board	25, 687	1, 565	1, 695	1, 144	30, 091	28, 454	1, 979	1, 690	1, 174	33, 297
Totals, all departments and agencies ..	138, 593	17, 570	12, 480	3, 222	171, 865	154, 476	20, 767	14, 051	3, 427	192, 721

¹ Includes other non-profit organizations and other governments.

² Includes grants-in-aid of research; excludes capital expenditures on research-development plant.

TABLE 6. Federal Government Expenditures on Conduct of Research-Development in the Life Sciences, by Department or Agency, (Excluding Armed Forces and D.R.B.), Fiscal Years 1960-61 and 1961-62

Department or Agency	1960-61					1961-62				
	Medicine	Agri- culture	Biology	Others	Total life sciences	Medicine	Agri- culture	Biology	Others	Total life sciences
thousands of dollars										
National Research Council	2,551	283	3,685	—	6,519	2,781	309	4,017	—	7,107
Atomic Energy:										
Atomic Energy Control Board	—	—	—	—	—	—	—	—	—	—
Atomic Energy of Canada Limited	—	—	461	—	461	—	—	594	—	594
Sub-totals	—	—	461	—	461	—	—	594	—	594
Agriculture:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	422	—	—	—	422	593	—	—	—	593
Research Branch	—	22,903	—	—	22,903	—	24,092	—	—	24,092
Sub-totals	422	22,903	—	—	23,325	593	24,092	—	—	24,685
Board of Grain Commissioners—Grain Research Laboratory	—	130	—	—	130	—	165	—	—	165
External Affairs	—	—	—	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	—	—	—	—	—	—	—	—	—	—
Fisheries:										
Conservation and Development Service	—	—	237	—	237	—	—	261	—	261
Inspection Service	—	—	—	5	5	—	—	—	6	6
Industrial Development Service	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	237	5	242	—	—	261	6	267
Fisheries Research Board of Canada	—	—	3,451	194	3,645	—	—	3,999	225	4,224
Forestry:										
Forest Entomology and Pathology Branch	—	—	4,142	—	4,142	—	—	4,708	—	4,708
Forest Research Branch	—	2,705	142	—	2,847	—	3,144	166	—	3,310
Forest Products Research Branch	—	—	204	204	408	—	—	215	215	430
Sub-totals	—	2,705	4,488	204	7,397	—	3,144	5,089	215	8,448
Mines and Technical Surveys:										
Dominion Observatories Branch	—	—	—	—	—	—	—	—	—	—
Geographical Branch	—	—	—	—	—	—	—	—	—	—
Geological Survey of Canada Branch	—	—	—	—	—	—	—	—	—	—
Mines Branch	—	—	—	—	—	—	—	—	—	—
Polar Continental Shelf Project	—	—	—	—	—	—	—	—	—	—
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
National Film Board	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	4,813	—	—	—	4,813	5,057	—	—	—	5,057
Northern Affairs and National Resources:										
National Parks Branch	—	—	743	—	743	—	—	810	—	810
National Museum of Canada	—	—	120	—	120	—	—	163	—	163
Northern Co-ordination and Research Centre ..	—	—	—	39	39	—	—	—	52	52
Water Resources Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	863	39	902	—	—	973	52	1,025
Post Office-Engineering and Development Branch	—	—	—	—	—	—	—	—	—	—
St. Lawrence Seaway Authority	—	—	—	—	—	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	—	—	—	—	—	—	—	—	—	—
Telecommunications and Electronics Branch	—	—	—	—	—	—	—	—	—	—
Marine Services:										
Marine Works Branch	—	—	—	—	—	—	—	—	—	—
Shipbuilding Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
Veterans Affairs	354	—	—	—	354	384	—	—	—	384
Defence Production	—	—	—	—	—	—	—	—	—	—
Canadian Arsenal Ltd.	—	—	—	—	—	—	—	—	—	—
Totals	8,140	26,021	13,185	442	47,788	8,815	27,710	14,933	498	51,956

TABLE 7A. Federal Government Expenditures of Conduct of Research-Development in the Physical Sciences, by Department or Agency, (Excluding Armed Forces and D.R.B.), Fiscal Year 1960-61

Department or agency	All engineering ¹	Chemistry	Physics	Geology geophysics and other earth sciences	Metallurgy	Mathematics	Other physical sciences	Total physical sciences
thousands of dollars								
National Research Council	12,756	3,968	—	4,818	—	283	—	21,825
Atomic Energy:								
Atomic Energy Control Board	98	—	500	—	52	—	—	650
Atomic Energy of Canada Limited	12,450	3,228	5,764	—	922	—	231	22,595
Sub-totals	12,548	3,228	6,264	—	974	—	231	23,245
Agriculture:								
Administration Branch	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	—	—	—	—	—	79	—	229
Research Branch	150	—	—	—	—	79	—	229
Sub-totals	150	—	—	—	—	79	—	229
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—
External Affairs	—	—	—	—	—	—	54	54
Central Mortgage and Housing Corporation	76	—	—	—	—	—	—	76
Fisheries:								
Conservation and Development Service	172	—	—	2	—	—	—	174
Inspection Service	—	1	—	—	—	—	—	1
Industrial Development Service	412	—	—	—	—	—	—	412
Sub-totals	584	1	—	2	—	—	—	587
Fisheries Research Board of Canada	146	656	—	316	97	—	—	1,215
Forestry:								
Forest Entomology and Pathology Branch	—	—	—	—	—	—	—	—
Forest Research Branch	—	—	—	—	—	—	—	—
Forest Products Research Branch	223	264	81	—	—	20	304	892
Sub-totals	223	264	81	—	—	20	304	892
Mines and Technical Surveys:								
Dominion Observatories Branch	—	—	978	1,468	—	—	—	2,446
Geographical Branch	—	—	—	—	—	—	406	406
Geological Survey of Canada Branch	—	174	116	2,610	—	—	—	2,900
Mines Branch	2,694	285	133	231	1,573	—	—	4,916
Polar Continental Shelf Project	57	—	—	—	—	—	—	57
Surveys and Mapping Branch	—	—	—	—	—	—	—	—
Sub-totals	2,751	459	1,227	4,309	1,573	—	406	10,725
National Film Board	29	—	—	—	—	—	—	29
National Health and Welfare	—	—	—	—	—	—	—	—
Northern Affairs and National Resources:								
National Parks Branch	—	—	—	—	—	—	—	—
National Museum of Canada	—	—	—	—	—	—	—	—
Northern Co-ordination and Research Centre	—	—	—	—	—	—	765	765
Water Resources Branch	—	—	—	—	—	—	765	765
Sub-totals	—	—	—	—	—	—	765	765
Post Office-Engineering and Development Branch	653	—	—	—	—	—	—	653
St. Lawrence Seaway Authority	20	—	—	—	—	—	—	20
Transport:								
Air Services:								
Meteorological Branch	—	—	—	—	—	—	385	385
Telecommunications and Electronics Branch	223	—	—	—	—	—	—	223
Marine Services:								
Marine Works Branch	—	—	—	—	—	—	—	—
Shipbuilding Branch	52	—	—	—	—	—	—	52
Sub-totals	275	—	—	—	—	—	385	660
Veterans Affairs	—	—	—	—	—	—	—	—
Defence Production	2,902	—	—	—	—	—	—	2,902
Canadian Arsenals	—	—	—	—	—	—	—	—
Totals	33,113	8,576	7,572	9,445	2,644	382	2,145	63,877

¹ Includes chemical, civil, electrical, mechanical and other engineering.

TABLE 7B. Federal Government Expenditures on Conduct of Research-Development in the Physical Sciences, by Department or Agency, (Excluding Armed Forces and D.R.B.), Fiscal Year 1961-62

Department or agency	All engineering ¹	Chemistry	Physics	Geology geophysics and other earth sciences	Metallurgy	Mathematics	Other physical sciences	Total physical sciences
thousands of dollars								
National Research Council	13,285	4,325	—	5,870	—	309	—	23,789
Atomic Energy:								
Atomic Energy Control Board	140	—	511	—	49	—	—	700
Atomic Energy of Canada Limited	16,339	3,862	7,129	—	1,485	—	297	29,112
Sub-totals	16,479	3,862	7,640	—	1,534	—	297	29,812
Agriculture:								
Administration Branch	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	—	—	—	—	—	—	—	—
Research Branch	170	—	—	—	—	71	—	241
Sub-totals	170	—	—	—	—	71	—	241
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—
External Affairs	—	—	—	—	—	—	22	22
Central Mortgage and Housing Corporation	188	—	—	—	—	—	—	188
Fisheries:								
Conservation and Development Service	187	—	—	1	—	—	—	188
Inspection Service	—	1	—	—	—	—	—	1
Industrial Development Service	654	—	—	—	—	—	—	654
Sub-totals	841	1	—	1	—	—	—	843
Fisheries Research Board of Canada	169	760	—	366	113	—	—	1,408
Forestry:								
Forest Entomology and Pathology Branch	—	—	—	—	—	—	—	—
Forest Research Branch	—	—	—	—	—	—	—	—
Forest Products Research Branch	257	321	86	—	—	20	431	1,115
Sub-totals	257	321	86	—	—	20	431	1,115
Mines and Technical Surveys:								
Dominion Observatories Branch	—	—	1,119	1,678	—	—	—	2,797
Geographical Branch	—	—	—	—	—	—	454	454
Geological Survey of Canada Branch	—	202	101	3,061	—	—	—	3,364
Mines Branch	2,884	299	144	262	1,752	—	—	5,341
Polar Continental Shelf Project	32	—	—	—	—	—	—	32
Surveys and Mapping Branch	—	—	—	—	—	—	—	—
Sub-totals	2,916	501	1,364	5,001	1,752	—	454	11,988
National Film Board	30	—	—	—	—	—	—	30
National Health and Welfare	—	—	—	—	—	—	—	—
Northern Affairs and National Resources:								
National Parks Branch	—	—	—	—	—	—	—	—
National Museum of Canada	—	—	—	—	—	—	—	—
Northern Co-ordination and Research Centre	—	—	—	—	—	—	—	—
Water Resources Branch	—	—	—	—	—	—	925	925
Sub-totals	—	—	—	—	—	—	925	925
Post Office-Engineering and Development Branch	125	3	3	—	1	—	—	132
St. Lawrence Seaway Authority	—	—	—	—	—	—	—	—
Transport:								
Air Services:								
Meteorological Branch	—	—	—	—	—	—	477	477
Telecommunications and Electronics Branch	334	—	—	—	—	—	—	334
Marine Services:								
Marine Works Branch	60	—	—	—	—	—	—	60
Shipbuilding Branch	47	—	—	—	—	—	—	47
Sub-totals	441	—	—	—	—	—	477	918
Veterans Affairs	—	—	—	—	—	—	—	—
Defence Production	5,500	—	—	—	—	—	—	5,500
Canadian Arsenals Ltd.	—	—	—	—	—	—	—	—
Totals	40,401	9,773	9,093	11,238	3,400	400	2,606	76,911

¹ Includes chemical, civil, electrical, mechanical and other engineering.

**TABLE 8. Federal Government Expenditures on Scientific Activities Type of Organization Performing Research
Fiscal Years 1960-61 and 1961-62**

Type of organization performing research	All departments and agencies excluding armed forces and D.R.B.		Department of National Defence and Defence Research Board		Total all departments and agencies	
	Millions of dollars	Per cent of total	Millions of dollars	Per cent of total	Millions of dollars	Per cent of total
Fiscal Year 1960-61						
Reporting unit	143.4	86.4	48.1	76.5	191.5	83.7
Profit organizations	7.5	4.5	10.1	16.0	17.6	7.7
Educational institutions	12.7	7.7	1.7	2.7	14.4	6.3
Others	2.3	1.4	3.0	4.8	5.3	2.3
Totals	165.9	100.0	62.9	100.0	228.8	100.0
Fiscal Year 1961-62						
Reporting unit	163.1	84.9	53.1	79.5	216.2	83.5
Profit organizations	11.6	6.0	9.4	14.1	21.0	8.1
Educational institutions	14.8	7.7	1.7	2.5	16.5	6.4
Others	2.6	1.4	2.6	3.9	5.2	2.0
Totals	192.1	100.0	66.8	100.0	258.9	100.0

**TABLE 9. Source of Funds for Scientific Activities in the Federal Government,
Fiscal Years 1960-61 and 1961-62**

Source of funds	All departments and agencies excluding armed forces and D.R.B.		Total all departments and agencies	
	1960-61	1961-62	1960-61	1961-62
millions of dollars				
Funds available from:				
Departmental or agency funds available as a result of annual estimates	152.4	176.9	213.0	238.4
Cost of indirect support by other units, departments or agencies	8.1	10.3	9.6	11.8
Transfers from other units of the department or agency	0.8	0.9	4.6	7.0
Transfers from other departments or agencies	7.1	7.0	7.1	7.0
Funds received directly from non-federal government sources	1.1	0.3	1.1	0.4
Other sources	2.2	2.0	2.2	2.0
Sub-totals	171.7	197.4	237.6	266.6
Less:				
Transfers to other units of the department or agency	—	—	0.5	0.4
Transfers to other departments or agencies	1.5	0.7	4.1	2.7
Support provided non-scientific activities	4.3	4.6	4.2	4.6
Sub-totals	5.8	5.3	8.8	7.7
Totals, funds available for scientific activities	165.9	192.1	228.8	258.9

TABLE 10. Personnel Employed in Conduct of Research-Development, by Field and Level of Training, as of March 31, 1961

Field of scientific training	All departments and agencies excluding armed forces and D.R.B.				All departments and agencies excluding armed forces, including D.R.B.			
	Level of training				Level of training			
	Bachelor	Master	Doctorate	Total	Bachelor	Master	Doctorate	Total
Physical scientists:								
Engineers, chemical	103	20	18	141	115	23	18	156
Engineers, civil	38	19	—	57	38	19	—	57
Engineers, electrical	117	24	12	153	177	60	19	256
Engineers, mechanical	168	34	12	214	190	39	13	242
Engineers, other	130	34	6	170	143	47	13	203
Sub-totals	556	131	48	735	663	188	63	914
Chemists	145	53	199	397	159	69	248	476
Physicists	78	59	159	296	128	110	228	466
Geologists, geophysicists and other earth scientists	45	31	147	223	49	36	148	233
Metallurgists	39	8	20	67	39	9	21	69
Mathematicians	8	10	17	35	19	21	19	59
Other physical scientists	30	44	9	83	32	44	9	85
Sub-totals	345	205	551	1, 101	426	289	673	1, 388
Totals, physical scientists	901	336	599	1,836	1,089	477	736	2,302
Life scientists:								
Medical scientists	52	51	71	174	52	51	71	174
Agricultural scientists	324	403	413	1,140	324	405	413	1,142
Biologists	54	130	159	343	56	141	177	374
Other	17	9	32	58	22	17	34	73
Totals, life scientists	447	593	675	1,715	454	614	695	1,763
Administrators (of research-development)	36	45	103	184	36	45	103	184
Others	3	—	5	8	39	13	26	78
Totals, professional scientists	1,387	974	1,382	3,743	1,618	1,149	1,560	4,327
Supporting personnel:								
Research-development technicians	—	—	—	3,118	—	—	—	3,918
Skilled craftsmen	—	—	—	1,503	—	—	—	1,854
Other supporting personnel	—	—	—	4,471	—	—	—	5,665
Total, supporting personnel	—	—	—	9,092	—	—	—	11,437
Total employed in the conduct of research-development	—	—	—	12,835	—	—	—	15,764

QUESTIONNAIRE

Complete in duplicate. Keep one copy for your files and return one copy in the enclosed envelope to the Dominion Bureau of Statistics, Ottawa

FOR IMMEDIATE ATTENTION

DOMINION BUREAU OF STATISTICS

Business Finance Division

FEDERAL GOVERNMENT EXPENDITURES ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1960-61 ACTUAL

AND ESTIMATES 1961-62

This survey is being conducted in cooperation with the National Research Council, in an effort to assess the magnitude and direction of the federal government scientific program.

It is desired to publish the results of this survey in detail giving figures for each reporting unit. Permission is requested to consider all information reported on this form as available for publication. If your unit does not wish to give this permission please indicate in an accompanying letter.

Complete the questionnaire as fully as possible. If precise figures are not available, your best estimates will be satisfactory. Address enquiries to Business Finance Division, Dominion Bureau of Statistics.

Note: If report is made at department or agency level, questions 1(c) and 1(g) do not apply.

1. TOTAL COST OF SCIENTIFIC ACTIVITIES BY SOURCE OF FUNDS: (see definition page 3 item 3.)	Actual Expenditures April 1/60 to March 31/61 \$ (000's)	Estimated Expenditures April 1/61 to March 31/62 \$ (000's)
Report total cost of all scientific activities including those performed by other organizations for your unit. Scientific activities comprise conduct of research and development including the planning and administering of research-development, grants-in-aid of research, capital expenditures on research-development plant, scientific data collection, scientific information, and scholarship and fellowship programs (see definitions, page 3 item 1). Include all professional and non-professional salaries, other direct costs and an estimated share of overhead expenses.		
(a) Departmental or agency funds available as a result of annual estimates		
(b) Cost of indirect support by other units, departments or agencies		
(c) Transfers from other units of your department or agency		
(d) Transfers from other Federal Government departments or agencies: Names:		
(e) Funds received directly from non-federal government sources: Names:		
(f) Other (specify)		
Sub-total		
Deduct:		
(g) Transfers to other units of your department or agency		
(h) Transfers to other federal government departments or agencies: Names		
(i) Support provided non-scientific activities		
Sub-total		
TOTAL COSTS		

2. TOTAL COST OF SCIENTIFIC ACTIVITIES BY TYPE OF ORGANIZATION: (see definition page 3 items 1 and 3).						
Scientific activities	Type of organization performing scientific activity					
	(1) Re- porting Unit ^a \$ (000's)	(2) Profit Or- ganizations \$ (000's)	(3) Edu- cational Institutions \$ (000's)	(4) Other Non-Profit Institutions \$ (000's)	(5) Others \$ (000's)	(6) Total \$ (000's)
Actual Expenditures April 1/60 - March 31/61						
(a) (i) Conduct of research-development including planning and administering research-development						
(ii) Grants-in-aid of research						
Sub-total						
(b) Capital expenditures on research-development plant						
(c) Scientific data collection						
(d) Scientific information						
(e) Scholarship & fellowship programs						
GRAND TOTAL (equals TOTAL COSTS shown in Question 1)						
Estimated Expenditures April 1/61 - March 31/62						
(a) (i) Conduct of research-development including planning and administering research-development						
(ii) Grants-in-aid of research						
Sub-total						
(b) Capital expenditures on research-development plant						
(c) Scientific data collection						
(d) Scientific information						
(e) Scholarship and fellowship programs						
GRAND TOTAL (equals TOTAL COSTS shown in Question 1)						

DEFINITION

1. **SCIENTIFIC ACTIVITIES** include all activities in the natural sciences concerned with the creation of new knowledge, new applications of knowledge to useful purposes, or the furtherance of both the creation of new knowledge or new applications. It does not include routine application of scientific knowledge or skills except when these are related to the creation and furtherance of new knowledge or applications. **Scientific research** is here defined as systematic and intensive study directed toward fuller knowledge of the phenomenon or subject. Development is the systematic use of scientific knowledge directed toward the production of useful materials, devices, systems or methods including design and development of prototype and processes. It excludes quality control or routine product testing. Specific categories of scientific activities to be included are as follows:

CONDUCT OF RESEARCH-DEVELOPMENT including the planning and administering of research-development includes research-development work done or financed by the reporting unit through contracts, testing evaluation through prototype stage, or pilot plants under the control of the unit; research on techniques and methods associated with the other scientific activities described below; planning and administering of research-development even when segregated from the conduct of research-development. It excludes routine testing.

CAPITAL EXPENDITURES ON RESEARCH-DEVELOPMENT plant includes acquisition, construction, major repairs to or alterations in structures, works, equipment or facilities, for use in research-development activities at federal or non-federal sites. These may be borne by the budget of the reporting department or agency or on the budget of another department or agency.

SCIENTIFIC DATA COLLECTION includes the collection of scientific data on natural phenomena where such data have general use such as for mapping; collection of geologic, hydrologic, geo-magnetic, meteorologic and other physical data; collection of entomological specimens and other biological data. Exclude data collection done in the course of carrying out a specific research-development project or program as this activity should be included under the conduct of research-development. Exclude also data collection done solely for internal operating purposes. If, however, these data are made available for general use, additional costs of material and personnel are to be included. The presentation of these data in reports, maps and other publications is included under dissemination of scientific information described below.

SCIENTIFIC INFORMATION includes library operations, translation, procurement and publication services in connection with information required in or resulting from scientific activities; standardization of terminology and the making of scientific or technical glossaries; and the support, including travel allowances of scientific conference and symposia.

SCHOLARSHIP AND FELLOWSHIP PROGRAMS are to include costs of scholarships and fellowships granted to governmental or non-governmental recipients who are or will be engaged in a scientific activity, and the administration costs of these programs.

2. **FISCAL YEAR** refers to government accounting time period beginning April 1 and ending March 31 of the following year.
 - (a) Actual - Based on expenditures or payments made and accounted for in annual reports for the fiscal year ending March 31, 1961.
 - (b) Estimate - Based on requirements for the fiscal year ending March 31, 1962 tabled in the House of Commons.

3. **COST OF SCIENTIFIC ACTIVITIES.** All funds received for and applied to scientific activities administered by the department or agency should be reported. The departments and agencies are all divisions of government classified as such by the Financial Administration Act plus agency corporations named in Schedule C of the Act. Included in department or agency funds are monies received directly from parliamentary appropriation or the amounts used in compiling the "estimates" for your department. Include as cost of indirect support by other units or agencies (question 1(b)) those funds administered by other departments or agencies for the benefit of these scientific activities, such as funds for capital buildings and equipment, relevant overhead costs, building and property maintenance, superannuation and costs of other services and salaries such as military pay and allowances, which are incurred on behalf of your scientific activities. Overhead costs at remote sites are to include net costs of requisite services such as housing, restaurants, etc. Exclude costs not attributable to a reporting unit unless the department or agency is wholly engaged in scientific activities. Other costs to be excluded are non-reimbursable services normally provided, such as those of the Civil Service Commission, imputed depreciation not charged against available funds, support of non-scientific activity and salaries of civilian personnel assigned on a non-reimbursable basis. Estimates based where possible on concrete indicators such as the number of scientific personnel may be made where the information required is not available. Transfers from other units of your department or agency are to include all such transfers of funds for scientific services. No entry is to be made if report is completed at department or agency level. Support provided non-scientific activities which are deducted (question 1(i)) includes any portion of the funds shown in 1(a) to 1(f) which are devoted directly or indirectly to the support of non-scientific activities.

4. **REPORTING UNIT:** Any unit or department for which a questionnaire is completed.

5. **PHYSICAL SCIENCES** include (a) physical sciences proper, that is, those sciences concerned primarily with the understanding of the natural phenomena associated with non-living things such as physics, chemistry and the earth sciences; (b) mathematics which includes those sciences employing logical reasoning with the aid of symbols and concerned with the development of methods of operations employing such symbols, such as mathematics, pure and applied; statistical methods, and computer research, exclusive of engineering; (c) engineering sciences, that is, those sciences which are concerned with studies directed toward developing scientific principles or toward making specific scientific principles usable in engineering practice such as metallurgy, chemical engineering, civil engineering, electrical engineering, mechanical engineering, etc., and (d) other physical sciences which includes any other sciences dealing with non-living matter which cannot be classified under the given headings.

LIFE SCIENCES include (a) medicine, which comprises those sciences that, apart from the strictly clinical aspects of professional medicine, are concerned primarily with the utilization of scientific principles in understanding human diseases and in maintaining and improving human health; (b) agriculture which comprises those sciences directed primarily toward understanding and improving agricultural productivity such as agronomy, animal husbandry, forestry, horticulture, range management, soil culture, etc., (c) biology, which comprises all life sciences other than those listed in (a) and (b) above, which deals with life processes and any work done in other disciplines primarily for the purpose of understanding life processes.

6. **RESEARCH-DEVELOPMENT TECHNICIANS:** Technical personnel having high school graduation or equivalent and additional technical training, who assist scientists and engineers in research-development work (i.e. laboratory technicians and assistants, draftsmen, etc.).

SKILLED CRAFTSMEN: Workers in positions requiring specialized training and experience and who are engaged in research-development work (i.e. glass blowers, machinists, model makers, etc.)

OTHER SUPPORTING PERSONNEL: All other persons whose pay is included in the cost of the conduct of research-development.

CATALOGUE No.

13-401

BIENNIAL



FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES
FISCAL YEAR 1962-63

DOMINION BUREAU OF STATISTICS

Business Finance Division
Planning and Development Section

DOMINION BUREAU OF STATISTICS

Business Finance Division

Planning and Development Section

FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES
FISCAL YEAR 1962-63

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PREFACE

This publication is the third in the series *Federal Government Expenditures on Scientific Activities*. It presents in tabular form estimates of various aspects of the scientific activities undertaken by the Federal Government in 1962-63, and preliminary estimates of the programmes for 1963-64 and 1964-65. The two previous reports covered the years 1958-59, 1959-60 (Catalogue No. 13-515) and 1960-61, 1961-62 (Catalogue No. 13-401).

The present publication covers current and capital expenditures on the different scientific activities, the organizations performing the activities, the scientific fields covered, the types of research-development involved, the areas of investigation and the number of personnel engaged in research and development.

The concepts and definitions were prepared with the aid of officials of the National Research Council, and they are in line with the Proposed Standard Practice for Surveys of Research and Development published by the Organization for Economic Co-operation and Development. The data cover programmes in the physical and life sciences, but do not include those in the social sciences. Scientific activities comprise research and development, grants-in-aid of research, collection of scientific data and the compilation and distribution of scientific information. Scholarships and fellowships for students working in these areas are included in expenditures on scientific activities.

The assistance of the departments and agencies of the Federal Government who have cooperated by submitting reports is gratefully acknowledged.

November 1964.

WALTER E. DUFFETT,
Dominion Statistician.

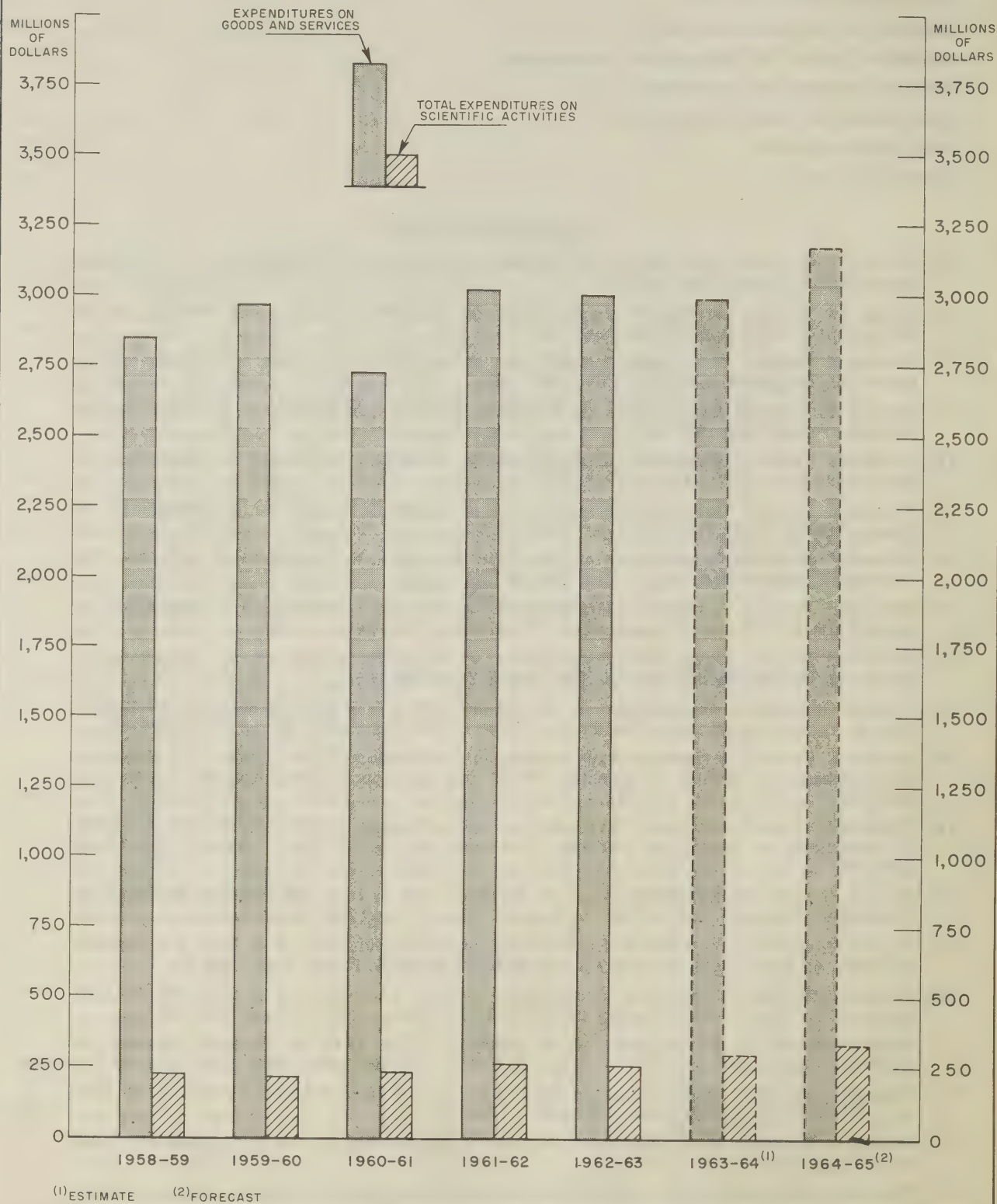
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COMPARISON OF TOTAL FEDERAL GOVERNMENT EXPENDITURES ON GOODS AND SERVICES WITH EXPENDITURES ON SCIENTIFIC ACTIVITIES



INTRODUCTION

The Federal Government has been involved in scientific activities since the formation of the Geological Survey shortly after Confederation. However, it was not until the National Research Council was established in 1916, that there was tangible government-wide recognition of the need to encourage scientific research and related activities.

Expenditures on scientific activities remained relatively small until the Second World War. During the war and particularly since 1945 there has been an accelerated growth in the scientific activities of the Federal Government; estimated expenditures have increased from \$35 million in 1945 to over \$333 million in 1964-65.¹

¹ For a description of the structural organization of scientific activities within the Federal Government, as well as special estimates prepared by the Royal Commission on Government Organization for 1951-52 to 1961-62, see the latter's Volume IV, Report 23: Scientific Research and Development, Queen's Printer, Ottawa, Canada.

More and more government departments and agencies are involved in activities of a scientific nature. Some, such as the National Research Council, are mainly research organizations, whereas others, such as Veterans Affairs, scientific programmes are a relatively minor part of their operations.

Total Expenditures

In 1964-65, expenditures on scientific activities are expected to reach \$333.6 million, or about 10% of the expenditures on goods and services of the Federal Government. The table below shows that in recent years expenditures on scientific activities have been increasing at a greater rate than expenditures on goods and services.

As mentioned in the Introduction, government financial support of scientific activities has shown a great increase since the Second World War. However, this trend has not been constant, but has tended to fluctuate, due largely to the initiation and cessation of some large costly programmes.

Comparison of Total Federal Government Expenditures on Goods and Services with Expenditures on Scientific Activities

	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64 Estimate	1964-65 Forecast
millions of dollars							
Expenditures on goods and services ¹	2,849	2,970	2,728	3,023	3,005	2,993	3,175
Total expenditures on scientific activities	225	214	231	261	256	297	334
Percentage of expenditures in scientific activities to total expenditures on goods and services	7.9	7.2	8.5	8.6	8.5	9.9	10.5

¹ Sources of figures: Budget Speeches of March 16, 1964, p. 31; of April 10, 1963, p. 62; of April 9, 1959, p. 75.

Five organizations continue to account for the bulk of all scientific work—in 1964-65 they accounted for 80.3% of all scientific expenditures, although in 1958-59 their expenditures were relatively more important (91.4%). At present, the National Research Council—Medical Research

Council (NRC-MRC) is the largest civilian spending group, with 18.8% of total disbursements. The costs of the scientific activities of Atomic Energy Control Board—Atomic Energy of Canada Limited (AECB-AECL) are next in size, amounting to 16.4% of total scientific cost.

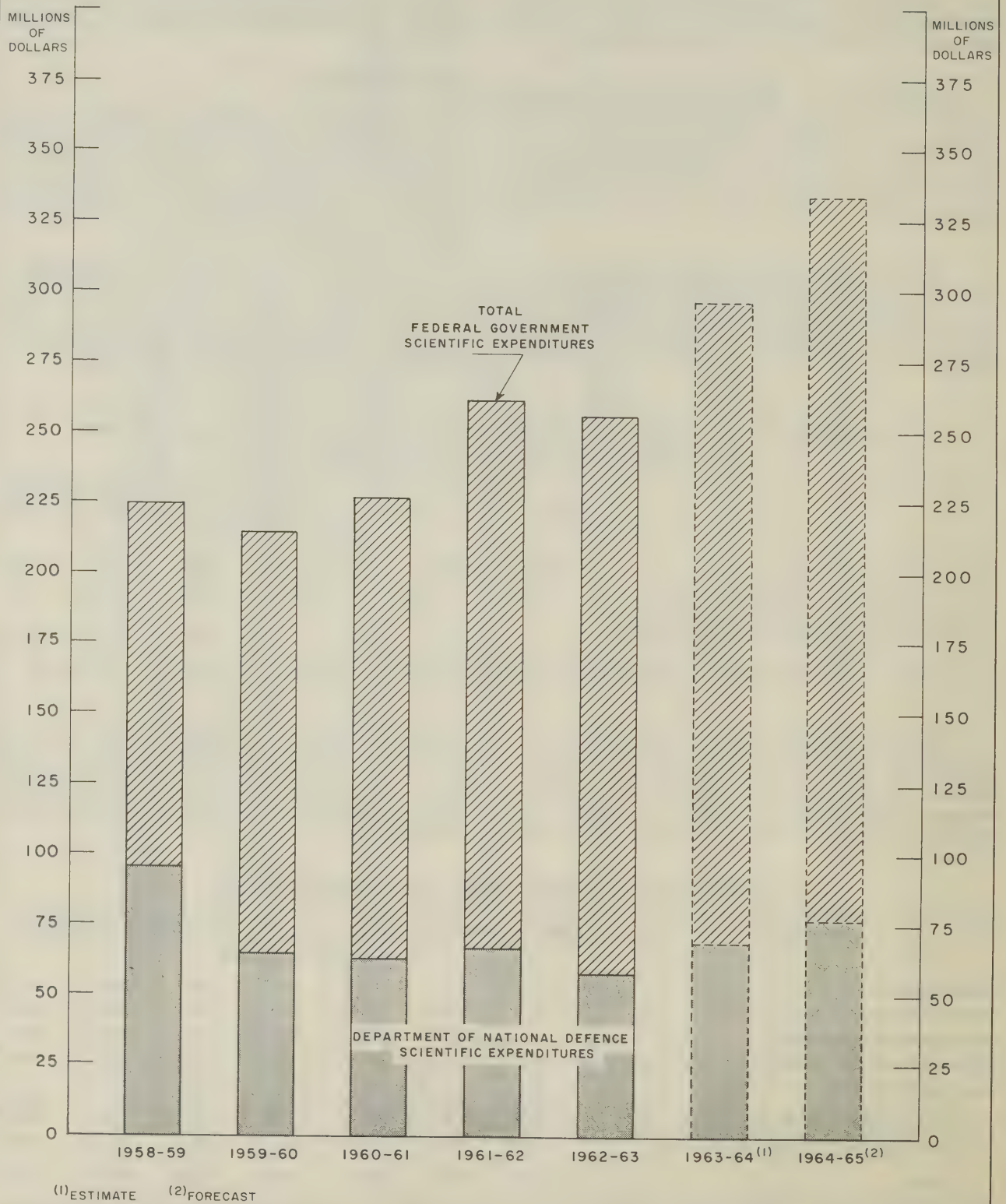
Organizations Disbursing Funds for Scientific Activities

Organizations	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
millions of dollars							
Agriculture	27.5	31.4	28.8	32.1	29.6	30.6	33.7
Atomic Energy (AECB and AECL)	27.9	32.8	39.9	40.7	39.4	46.5	54.7
Mines and Technical Surveys	27.1	27.7	29.5	39.9	39.4	38.9	40.9
National Research Council ¹	27.2	32.8	36.6	40.1	44.7	52.5	62.6
National Defence:							
Armed Forces	66.2	34.0	31.0	32.1	26.1	30.2	36.8
Defence Research Board	29.3	30.6	31.9	34.7	31.8	38.5	39.3
All other departments and agencies	19.3 ²	25.1 ²	33.3 ²	41.7 ²	44.7	59.4	65.6
Totals	224.5	214.4	231.0	261.3	255.7	296.6	333.6

¹ Including the Medical Research Council.

² Including estimates for the Patent and Copyright office of the Secretary of State, which was first surveyed in 1962-63.

COMPARISON OF SCIENTIFIC EXPENDITURES OF THE DEPARTMENT OF NATIONAL DEFENCE WITH TOTAL FEDERAL GOVERNMENT SCIENTIFIC EXPENDITURES



The chart below illustrates the relative decline in funds applied to the scientific work of the Department of National Defence. Thus in 1958-59 the expenditures of National Defence were 42.5% of total scientific expenditures, whereas by 1964-65 this percentage is expected to fall to 22.8%. The initial reduction (1958-59 to 1959-60) was due largely to the cessation of a program of aircraft development.

Classes of Scientific Activities

The largest scientific activity remains the conduct of Research and Development, which is expected to absorb about 63% of all funds for science in 1964-65. Conduct of R & D, as used in DBS surveys and reports, includes the performance, administration and planning of research and development. Capital expenditures in support of scientific

activities are the next largest scientific cost. Capital items used for scientific activities range from survey ships to libraries, but would not include space satellites and similar "expendable research equipment"² which are included in Conduct of R & D. Expenditures on grants-in-aid of research and on scholarship and fellowship programmes have approximately quadrupled since 1958-59. Grants-in-aid of research, which formerly consisted largely of grants for research in universities, now include sizeable grants for industrial research. The use of grants to encourage industrial research began in 1962-63, when both the NRC and the Defence Research Board (DRB) were authorized to make grants to industry. Such payments are estimated to total about \$6.9 million in 1964-65.

² For further notes on the concept of "expendable research equipment" see Notes on the Survey, p. 13

Expenditures by Classes of Scientific Activities

Scientific activity	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
millions of dollars							
Conduct of R & D	163.3 ¹	142.8 ¹	158.3	177.4	168.5	193.9	210.0
Grants-in-aid of research	8.5 ²	10.5 ²	13.6	15.3	20.5	25.7	32.9
Scientific data collection	18.1	20.6	15.7	21.1	25.0	26.7	27.9
Scientific information	6.0 ³	7.0 ³	7.2 ³	8.0 ³	9.7	10.1	11.2
Scholarship and fellowship programmes	1.3	2.0	2.0	2.5	3.1	3.9	5.7
Capital expenditures	27.3 ¹	31.5 ¹	34.2	37.0	28.9	36.3	45.9
Totals	224.5	214.4	231.0	261.3	255.7	296.6	333.6

¹ Current and capital expenditures on R & D have been adjusted to conform with procedures followed in subsequent years.

² Estimate.

³ Including estimates for the Patent and Copyright Office.

Performers of Scientific Activities

The Federal Government applies approximately three-quarters of its scientific funds to its own intra-mural programmes. Of course, this proportion is not constant; for example, the expenditures on R & D of the Department of Industry-Department of Defence Production (\$19.5 million in 1964-65) are for industrial research and development contracts, whereas the Department of Agriculture uses almost all its funds intra-murally.

The proportion of government funds used to support industrial scientific programs has varied

considerably, from a high of 21.7% in 1958-59 to a low of 7.6% in 1960-61. In 1964-65 it is expected to be about 15%. It should be realized that industry would supply most of the material for all scientific activities, but is considered a performing organization only when engaged in a government-supported scientific project.

Since the reporting unit must generally conduct most of its scientific data and information programmes itself, discussion of the performers of R & D alone is perhaps more meaningful.

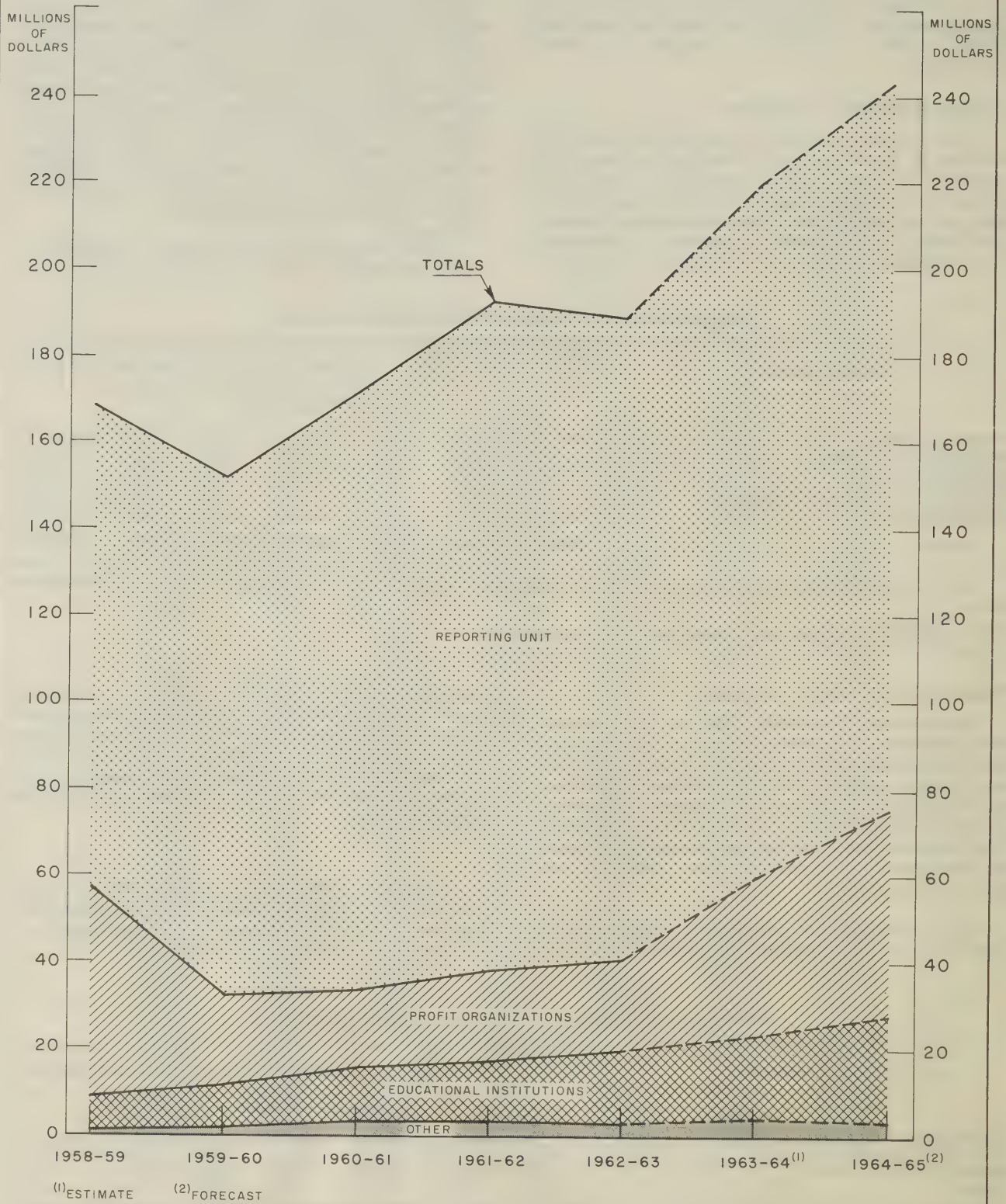
Performers of Federal Financed Scientific Activities

Performing organization	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
millions of dollars							
Reporting unit ¹	164.3	178.7	193.7	218.6	210.7	230.8	249.1
Profit organizations	48.7	21.2	17.6	21.0	21.8	38.6	50.8
Educational institutions	9.4	12.1	14.4	16.5	19.7	22.6	29.7
Others ²	2.1	2.4	5.3	5.2	3.5	4.6	4.0
Totals	224.5	214.4	231.0	261.3	255.7	296.6	333.6

¹ The reporting unit is the government department or agency which completes the survey questionnaire.

² Includes organizations such as hospitals, health foundations and provincial research organizations.

PERFORMERS OF FEDERALLY FINANCED RESEARCH AND DEVELOPMENT



Analysis of Conduct of Research and Development

The table below shows an apparent trend towards greater government financial support of R & D performed by others. For example, in 1958-59, 4.6% of government financed R & D was performed by Canadian educational institutions, but by 1964-65

research by this group is estimated to be about 10% of the total. Approximately three-quarters of this is financed by the NRC and the Medical Research Council.

Performers of Federally Financed Research and Development

Performing organization	1958-59	1959-60	1960-61	1961-62	1962-63	1963-64	1964-65
millions of dollars							
Reporting unit	111.1	119.5	138.6	154.5	148.9	159.8	167.2
Profit organization	48.3	21.1	17.6	20.8	20.2	36.8	48.1
Educational organization	7.8	10.0	12.5	14.1	16.9	19.0	24.4
Other	1.0	1.3	3.2	3.4	3.0	4.0	3.4
Totals	168.2	151.9	171.9	192.8	189.0	219.6	243.1

The financial support of industrial research and development (R & D performed by profit organizations) has varied markedly since 1958-59 when it was 28.7% of the total federally-financed R & D program compared to a low of 10.2% in 1960-61. Since 1962-63, financial support of profit organizations has increased from 10.7% of total federal support to an expected \$48.1 million or 19.8%.

An important feature of this increased financial support of industrial R & D is the change of sponsors. In 1958-59 virtually all of the funds for industrial R & D came from the Department of National Defence, but by 1964-65, this department will account for only about 39% of total government allocations. In the same year, the Department of Industry's (formerly the Department of Defence

Production) contracts under the defence programme will amount to \$19.5 million, or almost 41%.

About 14% of the total funds applied to industrial R & D will come from research grants administered by the NRC and the Defence Research Board.

Fields of Research and Development

Expenditures on research and development in absolute terms, in the three main scientific fields have continued to increase since 1958. However, over the last seven years there would seem to be three different trends in relative terms. Thus expenditures on R & D in engineering have increased markedly relative to the total of expenditures; other physical sciences experienced a slight decrease while a more pronounced reduction, again in relative terms was felt in the life sciences.

Federal Government Expenditures on Current Research and Development by Scientific Fields (Excluding the Department of National Defence and the Defence Research Board¹)

Fiscal year	Physical sciences				Life sciences		Total
	Engineering		Other				
	millions of dollars	per cent	millions of dollars	per cent	millions of dollars	per cent	millions of dollars
1958-59	20.4	25.2	25.1	31.1	35.3	43.7	80.8
1959-60	27.4	28.6	28.0	29.2	40.4	42.2	95.8
1960-61	33.2	29.7	30.7	27.5	47.8	42.8	111.7
1961-62	40.4	31.3	36.5	28.3	52.0	40.3	128.9
1962-63	45.7	33.4	37.2	27.2	54.1	39.5	137.0
1963-64	60.3	37.8	41.7	26.2	57.4	36.0	159.4
1964-65	65.6	37.5	48.0	27.4	61.3	35.0	174.9

¹ Expenditures of these two organizations are largely in Engineering and Other Physical Sciences (mainly physics). They have not been included here because of lack of data for earlier years.

Types of Research and Development

Information on the types of research and development³ was requested for the first time in this latest survey. The proportion of the three types of research and development varies not only with the scientific field but also with the orientation of the performer. Thus the research of the Department of Agriculture is mostly applied, basic research costs account for over half of the NRC's expenditures on R & D, and the Department of Industry supports only development projects.

In the life sciences, about 70% of R & D expenditures are used for applied research, slightly more than 25% for basic research and the remainder for development. Expenditures on applied research are relatively much heavier in the agricultural than in either the medical or biological sciences. Over three-quarters of the basic research in the life sciences is sponsored by three organizations: the

³ *Basic Research* is work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view.

Applied Research is work undertaken primarily for the advancement of scientific knowledge, but with a specific practical aim in view.

Development is the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones.

Department of Agriculture, the NRC and the Medical Research Council.

In the physical sciences, development is a considerably greater proportion of R & D costs, approximately one-third. This is due mainly to engineering development, which accounts for over one-half of all R & D expenditures in engineering. The Department of Industry and the Armed Forces are responsible for most of these development programmes.

A little less than half of the R & D expenditures in the physical sciences are believed to be for applied research. Over 75% of these applied research disbursements are financed by three organizations: the Defence Research Board, Atomic Energy of Canada Ltd. and the NRC. The greatest expenditures for applied research are made in engineering and physics.

The expenditures on basic research are slightly less than one-fifth of the total expenditures on R & D in the physical sciences. The National Research Council performs or pays for over half of this basic research, whilst the Atomic Energy agencies account for about a quarter. Basic research in physics, chemistry and the earth sciences is quantitatively the most important, being responsible for about three-quarters of expenditures for basic research.

Types of Research and Development

Scientific field	1962-63			1963-64			1964-65		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
millions of dollars									
Physical sciences:									
Engineering	2.3	34.7	36.8	2.9	39.7	50.3	3.4	41.9	60.0
Other	23.1	31.9	3.9	26.3	36.2	4.2	30.7	38.5	4.6
Sub-totals	25.4	66.6	40.7	29.2	75.9	54.5	34.1	80.4	64.6
Life sciences	14.4	40.2	1.6	15.6	42.5	1.8	18.2	43.9	1.9
Totals	39.8	106.8	42.3	44.8	118.4	56.3	52.3	124.3	66.5

Areas of Investigation

About one-third of government sponsored R & D is directed toward military uses. Most of the funds for military R & D are administered by the Department of National Defence and the Department of Industry. At present approximately 45% of the work is performed by Canadian industry.

R & D in the area of nuclear science accounts for roughly one-sixth of total expenditures. Atomic Energy of Canada Ltd. and the Atomic Energy

Control Board administer most of the funds. The bulk of the work is performed by government research units, although industry performs about 12% and universities about 4%.

Investigation in the field of space, although still relatively minor compared to the total government effort, is increasing quite rapidly. The Defence Research Board and the Telecommunications and Electronics Branch of the Department of Transport are the two organizations with the largest programmes in this area.

General Areas of Investigation

Area	Current R & D expenditures		
	1962-63	1963-64	1964-65
millions of dollars			
Nuclear science	31.5	34.9	38.6
Space travel and communications	1.7	3.1	7.3
Military science (excluding R & D in nuclear and space areas)	60.2	78.9	84.9
Other	95.5	102.7	112.2
Totals	188.9	219.6	243.0

NOTES ON THE SURVEY

1. Total Expenditures

Since scientific activities cut across the classifications used in government records (i.e. "standard objects" such as civil salaries and wages, postage, materials and supplies, etc.), it is generally difficult for the respondents to make accurate estimates. Organizations which are entirely engaged in scientific activities, or which have a division performing all their scientific work, can calculate their scientific costs more readily than others which do not have a clear distinction between their scientific and non-scientific activities. Another general problem is the allocation of "overhead" costs. For example, the Departments of Public Works and Finance, among others, provide services to other departments. Departments or agencies do not require the same degree of support, and, of course, the services provided any organization would normally vary from time to time. Estimates are provided of the more common forms of inter-departmental support, but only at department/agency level. There remains the problem of allocating the correct proportions to scientific activities. The imputed rent of an organization which provides its own buildings presents similar problems.

2. Classes of Scientific Activities

It is often difficult to distinguish between certain of the classifications used in these surveys. Research and development, scientific data collections and scientific information are often performed together and by the same people. A given project, if part of a larger research programme, would be classed as R & D; the same project, when outside of a research programme, is another scientific activity. The officials who can provide the financial data required may not always be able to classify the scientific activity.

The distinction between current and capital expenditures is sometimes hard to maintain. Much of the equipment used in research is extremely specialized and may have a very short life, large research units may also build some of their own equipment from materials on hand and perhaps with parts from discarded equipment. This has led to the concept of "expendable research equipment" which is used by some departments. To ensure that inter-departmental figures are comparable, adjustments are occasionally required to the capital expenditures reported by other departments. The inclusion of expendable research equipment in current expenditures may lead to fluctuations in costs not connected with variations in the amount of work performed. The allocation of expenditures on multi-purpose plant presents problems similar to those discussed in Section 1. Another problem is that the Armed Forces are not able to provide data on many of their capital projects.

3. Fields of Research and Development

It is extremely difficult to consistently distinguish between the scientific fields, since a project generally will require work in a number of fields. Furthermore, in a number of cases there is no longer a clear distinction between these fields, for example, "new" areas such as bio-chemistry, bio-physics and engineering physics, are becoming more common. The individual scientist may be able to classify his work by scientific field, but the person completing the questionnaire, who is generally an administrator, will often have to rely mainly on financial and other files which are readily available. Probably the most common way of allocating expenditures among the fields of science is on the basis of personnel, i.e. assuming that physicists are working only in physics, hence the amount of money spent in that field of research corresponds to the proportion of physicists among R & D personnel.

The exclusion of the social and psychological sciences from the survey has caused additional problems for a number of respondents. This is especially true for those involved in medical research. Research projects requiring anthropological as well as wildlife and botanical studies are also affected by this exclusion.

4. Types of Research and Development

The further classification of R & D expenditures into basic research, applied research and development was attempted for the first time in this last survey. There are a number of problems associated with such a classification. One problem is caused by the variety of definitions which people normally use — definitions which they may continue to use, perhaps only subconsciously, when completing a questionnaire. Even supposing that it were possible to clearly distinguish between the types of research or development, it should be realized that the progress of one project may take it through all three types at least once. A programme of R & D could contain a number of such projects, thus making the analysis quite complicated.

5. Personnel Engaged in R & D

For departments or agencies with distinct R & D units, the calculation of total R & D personnel should be relatively straightforward. In other cases the calculation may be quite difficult, since the persons must first be identified as employed in R & D, and then the proportion of time spent on R & D must be determined.

The information presented for March 1963 is not strictly comparable with the tables for earlier years. This is due to two factors (1) in earlier years there has been no distinction between total numbers and full-time equivalent, and (2) some classes of persons engaged in administrative support have been included for the first time.

STATISTICAL TABLES

TABLE 1 A. Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1962 - 63

Scientific activity	All departments and agencies					Excluding Department of National Defence				
	Performing organization				Total expenditures	Performing organization				Total expenditures
	Reporting unit	Profit organizations	Educational institutions	Others¹		Reporting unit	Profit organizations	Educational institutions	Others¹	
	thousands of dollars									
Scientific R & D:										
Conduct of R & D.....	148,755	18,431	227	1,071	168,484	106,706	12,624	227	142	119,699
Grants in aid of research	130	1,727	16,668	1,912	20,437	130	529	14,765	1,912	17,336
Sub-totals	148,885	20,158	16,895	2,983	188,921	106,836	13,153	14,992	2,054	137,035
Capital expenditures	23,395	—	—	—	23,395	21,205	—	—	—	21,205
Totals, scientific R & D	172,280	20,158	16,895	2,983	212,316	128,041	13,153	14,992	2,054	158,240
Other scientific activities:										
Scientific data collection	23,208	1,651	—	149	25,008	19,693	1,651	—	—	21,344
Scientific information	9,550	—	—	151	9,701	9,440	—	—	151	9,591
Capital expenditures	5,532	—	—	—	5,532	5,532	—	—	—	5,532
Scholarship and fellowship programmes	70	—	2,809	216	3,095	70	—	2,779	216	3,065
Sub-totals	38,360	1,651	2,809	516	43,336	34,735	1,651	2,779	367	39,532
Totals, all scientific activities.....	210,640	21,809	19,704	3,499	255,652	162,776	14,804	17,771	2,421	197,772

¹ Includes organizations such as hospitals, health foundations and provincial research institutes.

TABLE 1 B. Estimated Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1963 - 64

Scientific activity	All departments and agencies					Excluding Department of National Defence				
	Performing organization				Total expenditures	Performing organization				Total expenditures
	Reporting unit	Profit organizations	Educational institutions	Others ¹		Reporting unit	Profit organizations	Educational institutions	Others ¹	
	thousands of dollars									
Scientific R & D:										
Conduct of R & D	159,633	32,596	299	1,317	193,845	113,814	24,044	299	126	138,283
Grants in aid of research	159	4,182	18,663	2,710	25,714	159	1,508	16,778	2,710	21,155
Sub-totals	159,792	36,778	18,962	4,027	219,559	113,973	25,552	17,077	2,836	159,438
Capital expenditures	32,814	—	—	—	32,814	28,120	—	—	—	28,120
Totals, scientific R & D	192,606	36,778	18,962	4,027	252,373	142,093	25,552	17,077	2,836	187,558
Other scientific activities:										
Scientific data collection.....	24,790	1,769	—	150	26,709	21,190	1,769	—	—	22,959
Scientific information	9,856	—	—	219	10,075	9,740	—	—	219	9,959
Capital expenditures	3,494	—	—	—	3,494	3,494	—	—	—	3,494
Scholarship and fellowship programmes....	86	—	3,600	250	3,936	85	—	3,569	250	3,904
Sub-totals	38,226	1,769	3,600	619	44,214	34,509	1,769	3,569	469	40,316
Totals, all scientific activities	230,832	38,547	22,562	4,646	296,587	176,602	27,321	20,646	3,305	227,874

¹ Includes organizations such as hospitals, health foundations and provincial research institutes.

TABLE 1 C. Estimated Federal Government Expenditures on Scientific Activities, by Activity and by Performing Organization, Fiscal Year 1964 - 65

Scientific activity	All departments and agencies					Excluding Department of National Defence				
	Performing organization				Total expenditures	Performing organization				Total expenditures
	Reporting unit	Profit organizations	Educational institutions	Others ¹		Reporting unit	Profit organizations	Educational institutions	Others ¹	
	thousands of dollars									
Scientific R & D:										
Conduct of R & D	166,981	41,236	495	1,356	210,068	120,309	26,935	495	151	147,890
Grants in aid of research	193	6,863	23,877	2,027	32,960	193	2,713	22,037	2,027	26,970
Sub-totals	167,174	48,099	24,372	3,383	243,028	120,502	29,648	22,532	2,178	174,860
Capital expenditures	41,647	600	—	—	42,247	37,707	600	—	—	38,307
Totals, scientific R & D	208,821	48,699	24,372	3,383	285,275	158,209	30,248	22,532	2,178	213,167
Other scientific activities:										
Scientific data collection	25,577	2,171	—	150	27,898	21,977	2,171	—	—	24,148
Scientific information	10,992	—	—	204	11,196	10,875	—	—	204	11,079
Capital expenditures	3,618	—	—	—	3,618	3,618	—	—	—	3,618
Scholarship and fellowship programmes ..	108	—	5,302	250	5,660	108	—	5,252	250	5,610
Sub-totals	40,295	2,171	5,302	604	48,372	36,578	2,171	5,252	454	44,455
Totals, all scientific activities	249,116	50,870	29,674	3,987	333,647	194,787	32,419	27,784	2,632	257,622

¹ Includes organizations such as hospitals, health foundations and provincial research institutes.

**TABLE 2A. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity,
Fiscal Year 1962-63**

Department or agency	Scientific R & D					Other scientific activities					Total, all scientific activities
	Conduct of R & D	Grants in aid of research	Sub- total	Capital expendi- tures	Total, scientific R & D	Scientific data collection	Scientific informa- tion	Capital expendi- tures	Scholar- ship and fellow- ship pro- grammes	Sub- total	
thousands of dollars											
Agriculture:											
Administration Branch—Information Division	—	—	—	—	—	—	426	—	—	426	426
Health of Animals Branch—Animal Pathology Division	795	—	795	25	820	—	5	—	—	5	825
Research Branch	23,856	147	24,003	3,471	27,474	—	476	—	—	476	27,950
Sub-totals	24,651	147	24,798	3,496	28,294	—	907	—	—	907	29,201
Board of Grain Commissioners Grain Research Laboratory	330	—	330	27	357	8	33	—	—	41	398
Atomic Energy:											
Atomic Energy Control Board	—	770	770	—	770	—	—	—	—	—	770
Atomic Energy of Canada Limited	29,193	—	29,193	9,349	38,542	—	—	—	90	90	38,632
Sub-totals	29,193	770	29,963	9,349	39,312	—	—	—	90	90	39,402
Canadian Arsenals Limited	412	—	412	—	412	—	—	—	—	—	412
Central Mortgage and Housing Corporation	18	37	55	—	55	—	—	—	—	—	55
Defence Production—Department of Industry	8,000	—	8,000	—	8,000	—	—	—	—	—	8,000
Fisheries:											
Conservation and Development Service	1,004	—	1,004	817	1,821	—	—	—	—	—	1,821
Industrial Development Service	624	10	634	28	662	—	—	—	—	—	662
Inspection Service	371	—	371	25	396	—	—	—	—	—	396
Sub-totals	1,999	10	2,009	870	2,879	—	—	—	—	—	2,879
Fisheries Research Board of Canada	5,916	23	5,939	1,487	7,426	—	—	—	1	1	7,427
Forestry:											
Administration Branch	—	5	5	—	5	—	—	—	—	—	5
Forest Entomology and Pathology Branch	3,037	10	3,047	249	3,296	1,380	184	—	—	1,564	4,860
Forest Products Research Branch	1,417	—	1,417	80	1,497	—	54	—	—	54	1,551
Forest Research Branch	2,636	—	2,636	313	2,949	—	21	—	—	21	2,970
Sub-totals	7,090	15	7,105	642	7,747	1,380	259	—	—	1,639	9,386
Medical Research Council	—	3,644	3,644	—	3,644	—	—	—	724	724	4,368
Mines and Technical Surveys:											
Dominion Observatories Branch	2,183	—	2,183	521	2,704	—	32	—	—	32	2,736
Geographical Branch	—	—	—	—	—	660	25	—	—	685	685
Geological Survey of Canada	3,736	75	3,811	379	4,190	3,230	443	—	—	3,673	7,863
Marine Sciences Branch	867	—	867	658	1,525	6,142	47	4,944	—	11,133	12,658
Mines Branch	4,858	10	4,868	434	5,302	540	807	—	—	1,347	6,649
Polar Continental Shelf Project	158	—	158	—	158	1,424	1	262	—	1,687	1,845
Surveys and Mapping Branch	—	—	—	—	—	4,763	2,238	—	—	7,001	7,001
Sub-totals	11,802	85	11,887	1,992	13,879	16,759	3,593	5,206	—	25,558	39,437
Dominion Coal Board	—	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	1,798	3,598	5,396	942	6,338	461	46	19	82	608	6,946
National Research Council	25,304	8,921	34,225	1,949	36,174	179	1,842	—	2,168	4,189	40,363
Northern Affairs and National Resources:											
Canadian Wildlife Service	596	—	596	91	687	255	40	—	—	295	982
Northern Coordination and Research Centre	60	—	60	—	60	80	17	—	—	97	157
Water Resources Branch	611	—	611	—	611	1,806	239	307	—	2,352	2,963
Sub-totals	1,267	—	1,267	91	1,358	2,141	296	307	—	2,744	4,102
Post Office—Engineering Branch	148	—	148	5	153	—	3	—	—	3	156
Secretary of State:											
National Film Board	29	—	29	7	36	—	—	—	—	—	36
National Museum	141	—	141	—	141	261	25	—	—	286	427
Patent and Copyright Office—Patent Division	—	—	—	—	—	—	2,533	—	—	2,533	2,533
Sub-totals	170	—	170	7	177	261	2,558	—	—	2,819	2,996
Transport:											
Civil Aviation Branch	8	—	8	—	8	—	—	—	—	—	8
Construction Branch	50	—	50	20	70	—	—	—	—	—	70
Marine Works Branch	83	—	83	82	165	155	—	—	—	155	320
Meteorological Branch	792	86	878	231	1,109	—	—	—	—	—	1,109
Telecommunications and Electronics Branch ..	258	—	258	15	273	—	54	—	—	54	327
Sub-totals	1,191	86	1,277	348	1,625	155	54	—	—	209	1,834
Veterans Affairs	410	—	410	—	410	—	—	—	—	—	410
Totals, all departments and agencies ex- cept National Defence	119,699	17,336	137,035	21,205	158,240	21,344	9,591	5,532	3,065	39,532	197,772
National Defence:											
Armed Forces	22,302	—	22,302	96 ¹	22,398	3,664	—	—	—	3,664	26,062
Defence Research Board	26,483	3,101	29,584	2,094	31,678	—	110	—	30	140	31,818
Sub-totals	48,785	3,101	51,886	2,190	54,076	3,664	110	—	30	3,804	57,880
Totals, all departments and agencies	168,484	20,437	188,921	23,395	212,316	25,008	9,701	5,532	3,095	43,336	255,652

¹ Many of the capital costs of the Armed Forces are not available.

TABLE 2B. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1963-64

Department or agency	Scientific R & D					Other scientific activities					Total, all scientific activities
	Conduct of R & D	Grants in aid of research	Sub-total	Capital expenditures	Total scientific R & D	Scientific data collection	Scientific information	Capital expenditures	Scholarship and fellowship programmes	Sub-total	
thousands of dollars											
Agriculture:											
Administration Branch—Information Division..	—	—	—	—	—	—	440	—	—	440	440
Health of Animals Branch—Animal Pathology Division	858	—	858	18	876	—	5	—	—	5	881
Research Branch	24,048	128	24,176	4,194	28,370	—	485	—	—	485	28,855
Sub-totals	24,906	128	25,034	4,212	29,246	—	930	—	—	930	30,176
Board of Grain Commissioners—Grain Research Laboratory	325	—	325	32	357	9	35	—	—	44	401
Atomic Energy:											
Atomic Energy Control Board	—	900	900	—	900	—	—	—	—	—	900
Atomic Energy of Canada Limited	32,093	—	32,093	13,466	45,559	—	—	—	35	35	45,594
Sub-totals	32,093	900	32,993	13,466	46,459	—	—	—	35	35	46,494
Canadian Arsenals Limited	355	—	355	—	355	—	—	—	—	—	355
Central Mortgage and Housing Corporation	14	29	43	—	43	—	—	—	—	—	43
Defence Production—Department of Industry	19,000	—	19,000	—	19,000	—	—	—	—	—	19,000
Fisheries:											
Conservation and Development Service	1,048	—	1,048	457	1,505	—	—	—	—	—	1,505
Industrial Development Service	599	10	609	18	627	—	—	—	—	—	627
Inspection Service	377	—	377	32	409	—	—	—	—	—	409
Sub-totals	2,024	10	2,034	507	2,541	—	—	—	—	—	2,541
Fisheries Research Board of Canada	6,192	25	6,217	970	7,187	—	—	—	5	5	7,192
Forestry:											
Administration Branch	—	24	24	—	24	—	—	—	—	—	24
Forest Entomology and Pathology Branch	3,216	—	3,216	1,554	4,770	1,466	195	—	—	1,661	6,431
Forest Products Research Branch	1,443	—	1,443	80	1,523	—	62	—	—	62	1,585
Forest Research Branch	2,740	—	2,740	237	2,977	—	25	—	—	25	3,002
Sub-totals	7,399	24	7,423	1,871	9,294	1,466	282	—	—	1,748	11,042
Medical Research Council	—	4,286	4,286	—	4,286	—	—	—	898	898	5,184
Mines and Technical Surveys:											
Dominion Observatories Branch	2,404	—	2,404	551	2,955	—	30	—	—	30	2,985
Geographical Branch	—	—	—	—	—	771	27	—	—	798	798
Geological Survey of Canada	3,925	75	4,000	251	4,251	3,485	481	—	—	3,966	8,217
Marine Sciences Branch	910	—	910	100	1,010	7,150	55	3,000	—	10,205	11,215
Mines Branch	4,896	35	4,931	505	5,436	544	813	—	—	1,357	6,793
Polar Continental Shelf Project	155	—	155	—	155	1,397	1	166	—	1,564	1,719
Surveys and Mapping Branch	—	—	—	—	—	4,838	2,364	—	—	7,202	7,202
Sub-totals	12,290	110	12,400	1,407	13,807	18,185	3,771	3,166	—	25,122	38,929
Dominion Coal Board	—	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	1,801	4,308	6,109	824	6,933	491	47	21	205	764	7,697
National Research Council	26,831	11,249	38,080	4,334	42,414	195	1,908	—	2,761	4,864	47,278
Northern Affairs and National Resources:											
Canadian Wildlife Service	740	—	740	71	811	317	40	—	—	357	1,168
Northern Coordination and Research Centre	70	—	70	—	70	91	20	—	—	111	181
Water Resources Branch	1,007	—	1,007	—	1,007	1,831	214	307	—	2,352	3,359
Sub-totals	1,817	—	1,817	71	1,888	2,239	274	307	—	2,820	4,708
Post Office—Engineering Branch	215	—	215	16	231	—	3	—	—	3	234
Secretary of State:											
National Film Board	38	—	38	2	40	—	—	—	—	—	40
National Museum	119	—	119	—	119	216	25	—	—	241	360
Patent and Copyright Office—Patent—Division	—	—	—	—	—	—	2,664	—	—	2,664	2,664
Sub-totals	157	—	157	2	159	216	2,689	—	—	2,905	3,064
Transport:											
Civil Aviation Branch	8	—	8	—	8	—	—	—	—	—	8
Construction Branch	50	—	50	6	56	—	—	—	—	—	56
Marine Works Branch	201	—	201	81	282	158	—	—	—	158	440
Meteorological Branch	970	86	1,056	306	1,362	—	—	—	—	—	1,362
Telecommunications and Electronics Branch	1,215	—	1,215	15	1,230	—	20	—	—	20	1,250
Sub-totals	2,444	86	2,530	408	2,938	158	20	—	—	178	3,116
Veterans Affairs	420	—	420	—	420	—	—	—	—	—	420
Totals, all departments and agencies except National Defence	138,283	21,155	159,438	28,120	187,558	22,959	9,959	3,494	3,904	40,316	227,874
National Defence:											
Armed Forces	23,939	—	23,939	2,500 ¹	26,439	3,750	—	—	—	3,750	30,189
Defence Research Board	31,623	4,559	36,182	2,194	38,376	—	116	—	32	148	38,524
Sub-totals	55,562	4,559	60,121	4,694	64,815	3,750	116	—	32	3,898	68,713
Totals, all departments and agencies	193,845	25,714	219,559	32,814	252,373	26,709	10,075	3,494	3,936	44,214	296,587

¹ Many of the capital expenditures of the Armed Forces are not available.

TABLE 2 C. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1964 - 65

Department or agency	Scientific R & D					Other scientific activities					Total, all scientific activities
	Conduct of R & D	Grants in aid of research	Sub- total	Capital expend- itures	Total, all scientific R & D	Scientific data collection	Scientific informa- tion	Capital expend- itures	Scholar- ship and fellow- ship pro- grammes	Sub- total	
thousands of dollars											
Agriculture:											
Administration Branch—Information Division ..	—	—	—	—	—	—	457	—	—	457	457
Health of Animals Branch—Animal Pathology Division	940	—	940	185	1,125	—	5	—	—	5	1,130
Research Branch	25,036	145	25,181	6,002	31,183	—	500	—	—	500	31,683
Sub-totals	25,976	145	26,121	6,187	32,308	—	962	—	—	962	33,270
Board of Grain Commissioners—Grain Research Laboratory	342	—	342	42	384	9	37	—	—	46	430
Atomic Energy:											
Atomic Energy Control Board	—	1,250	1,250	—	1,250	—	—	—	—	—	1,250
Atomic Energy of Canada Limited	35,547	—	35,547	17,807	53,354	—	—	—	50	50	53,404
Sub-totals	35,547	1,250	36,797	17,807	54,604	—	—	—	50	50	54,654
Canadian Arsenals Limited	—	—	—	—	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	32	64	96	—	96	—	—	—	—	—	96
Defence Production—Department of Industry	19,500	—	19,500	—	19,500	—	—	—	—	—	19,500
Fisheries:											
Conservation and Development Service	1,060	—	1,060	545	1,605	—	—	—	—	—	1,605
Industrial Development Service	692	10	702	26	728	—	—	—	—	—	728
Inspection Service	392	—	392	29	421	—	—	—	—	—	421
Sub-totals	2,144	10	2,154	600	2,754	—	—	—	—	—	2,754
Fisheries Research Board of Canada	6,465	45	6,510	1,693	8,203	—	—	—	5	5	8,208
Forestry:											
Administration Branch	—	59	59	600	659	—	—	—	—	—	659
Forest Entomology and Pathology Branch	3,423	—	3,423	1,441	4,864	1,564	209	—	—	1,773	6,637
Forest Products Research Branch	1,591	—	1,591	426	2,017	—	71	—	—	71	2,088
Forest Research Branch	2,876	—	2,876	396	3,272	—	31	—	—	31	3,303
Sub-totals	7,890	59	7,949	2,863	10,812	1,564	311	—	—	1,875	12,687
Medical Research Council	—	5,354	5,354	—	5,354	—	—	—	1,680	1,680	7,034
Mines and Technical Surveys:											
Dominion Observatories Branch	2,401	—	2,401	944	3,345	—	38	—	—	38	3,383
Geographical Branch	—	—	—	—	—	831	34	—	—	865	865
Geological Survey of Canada	4,025	100	4,125	394	4,519	3,713	567	—	—	4,280	8,799
Marine Sciences Branch	1,009	—	1,009	200	1,209	7,756	68	3,160	—	10,984	12,193
Mines Branch	5,013	50	5,063	395	5,458	557	832	—	—	1,389	6,847
Polar Continental Shelf Project	146	—	146	—	146	1,406	1	132	—	1,539	1,685
Surveys and Mapping Branch	—	—	—	—	—	4,651	2,438	—	—	7,089	7,089
Sub-totals	12,594	150	12,744	1,933	14,677	18,914	3,978	3,292	—	26,184	40,861
Dominion Coal Board	50	—	50	—	50	—	—	—	—	—	50
National Health and Welfare	2,037	3,546	5,583	801	6,384	529	79	21	311	940	7,324
National Research Council	27,649	16,247	43,896	5,487	49,383	200	2,384	—	3,560	6,144	55,527
Northern Affairs and National Resources:											
Canadian Wildlife Service	795	—	795	294	1,089	341	60	—	4	405	1,494
Northern Coordination and Research Centre	120	—	120	—	120	135	21	—	—	156	276
Water Resources Branch	1,525	—	1,525	—	1,525	2,021	267	305	—	2,593	4,118
Sub-totals	2,440	—	2,440	294	2,734	2,497	348	305	4	3,154	5,888
Post Office—Engineering Branch	181	—	181	8	189	—	3	—	—	3	192
Secretary of State:											
National Film Board	42	—	42	—	42	—	—	—	—	—	42
National Museum	133	—	133	—	133	245	25	—	—	270	403
Patent and Copyright Office—Patent Division	—	—	—	—	—	—	2,922	—	—	2,922	2,922
Sub-totals	175	—	175	—	175	245	2,947	—	—	3,192	3,367
Transport:											
Civil Aviation Branch	8	—	8	—	8	—	—	—	—	—	8
Construction Branch	50	—	50	6	56	—	—	—	—	—	56
Marine Works Branch	108	—	108	170	278	190	—	—	—	190	468
Meteorological Branch	1,159	100	1,259	406	1,665	—	—	—	—	—	1,665
Telecommunications and Electronics Branch ..	3,104	—	3,104	10	3,114	—	30	—	—	30	3,144
Sub-totals	4,429	100	4,529	592	5,121	190	30	—	—	220	5,341
Veterans Affairs	439	—	439	—	439	—	—	—	—	—	439
Totals, all departments and agencies ex- cept National Defence	147,890	26,970	174,860	38,307	213,167	24,148	11,079	3,618	5,610	44,455	257,622
National Defence:											
Armed Forces	30,882	—	30,882	2,135 ¹	33,017	3,750	—	—	—	3,750	36,767
Defence Research Board	31,296	5,990	37,286	1,805	39,091	—	117	—	50	167	39,258
Sub-totals	62,178	5,990	68,168	3,940	72,108	3,750	117	—	50	3,917	76,025
Totals, all departments and agencies	210,068	32,960	243,028	42,247	285,275	27,898	11,196	3,618	5,660	48,372	333,647

¹ Many of the Armed Forces' expenditures on plant for scientific R & D are not available.

TABLE 5. Federal Government Expenditures on Conduct of Research-Development, by Performing Organization and Department or Agency Fiscal Years 1960-61 and 1961-62

Department or agency	1960-61					1961-62				
	Performing organization				Total conduct of research-development ²	Performing organization				Total conduct of research-development ²
	Reporting unit	Profit organizations	Educational institutions	Others ¹		Reporting unit	Profit organizations	Educational institutions	Others ¹	
	thousands of dollars									
National Research Council	20,145	—	7,724	475	28,344	21,474	—	9,085	337	30,896
Atomic Energy:										
Atomic Energy Control Board	—	—	650	—	650	—	—	700	—	700
Atomic Energy of Canada Limited	19,250	3,743	63	—	23,056	24,005	5,571	130	—	29,706
Sub-totals	19,250	3,743	713	—	23,706	24,005	5,571	830	—	30,406
Agriculture:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	422	—	—	—	422	593	—	—	—	593
Research Branch	22,996	—	136	—	23,132	24,193	—	140	—	24,333
Sub-totals	23,418	—	136	—	23,554	24,786	—	140	—	24,926
Board of Grain Commissioners—Grain Research Laboratory	130	—	—	—	130	165	—	—	—	165
External Affairs	—	—	—	54	54	—	—	—	22	22
Central Mortgage and Housing Corporation	—	—	—	76	76	50	—	—	138	188
Fisheries:										
Conservation and Development Service	411	—	—	—	411	449	—	—	—	449
Inspection Service	6	—	—	—	6	7	—	—	—	7
Industrial Development Service	297	56	—	59	412	331	210	9	104	654
Sub-totals	714	56	—	59	829	787	210	9	104	1,110
Fisheries Research Board of Canada	4,860	—	—	—	4,860	5,609	—	23	—	5,632
Forestry:										
Forest Entomology and Pathology Branch	4,119	—	23	—	4,142	4,697	—	11	—	4,708
Forest Research Branch	2,847	—	—	—	2,847	3,310	—	—	—	3,310
Forest Products Research Branch	1,300	—	—	—	1,300	1,545	—	—	—	1,545
Sub-totals	8,266	—	23	—	8,289	9,552	—	11	—	9,563
Mines and Technical Surveys:										
Dominion Observatories Branch	2,446	—	—	—	2,446	2,797	—	—	—	2,797
Geographical Branch	402	—	4	—	406	454	—	—	—	454
Geological Survey of Canada Branch	2,850	—	50	—	2,900	3,289	—	75	—	3,364
Mines Branch	4,916	—	—	—	4,916	5,341	—	—	—	5,341
Polar Continental Shelf Project	21	36	—	—	57	32	—	—	—	32
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	10,635	36	54	—	10,725	11,913	—	75	—	11,988
National Film Board	29	—	—	—	29	30	—	—	—	30
National Health and Welfare	1,643	—	2,013	1,157	4,813	1,727	—	2,000	1,330	5,057
Northern Affairs and National Resources:										
National Parks Branch	743	—	—	—	743	810	—	—	—	810
National Museum of Canada	—	—	120	—	120	—	—	163	—	163
Northern Co-ordination and Research Centre	29	—	—	10	39	42	—	—	10	52
Water Resources Branch	518	—	—	247	765	623	—	—	302	925
Sub-totals	1,290	—	120	257	1,667	1,475	—	163	312	1,950
Post Office-Engineering and Development Branch	50	603	—	—	653	56	76	—	—	132
St. Lawrence Seaway Authority	20	—	—	—	20	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	385	—	—	—	385	452	—	25	—	477
Telecommunications and Electronics Branch	223	—	—	—	223	334	—	—	—	334
Marine Services:										
Marine Works Branch	—	—	—	—	—	60	—	—	—	60
Shipbuilding Branch	—	52	—	—	52	—	47	—	—	47
Sub-totals	608	52	—	—	660	846	47	25	—	918
Veterans Affairs	352	—	2	—	354	384	—	—	—	384
Defence Production	—	2,902	—	—	2,902	—	5,500	—	—	5,500
Canadian Arsenals Ltd.	1,034	—	—	—	1,034	813	—	—	—	813
Totals	92,444	7,392	10,785	2,078	112,699	103,672	11,404	12,361	2,243	129,680
National Defence (excluding Defence Research Board)	20,462	8,613	—	—	29,075	22,350	7,384	—	10	29,744
Defence Research Board	25,687	1,585	1,695	1,144	30,091	28,454	1,979	1,690	1,174	33,297
Totals, all departments and agencies ..	138,593	17,570	12,480	3,222	171,865	154,476	20,767	14,051	3,427	192,721

¹ Includes other non-profit organizations and other governments.

² Includes grants-in-aid of research; excludes capital expenditures on research-development plant.

TABLE 6. Federal Government Expenditures on Conduct of Research-Development in the Life Sciences, by Department or Agency, (Excluding Armed Forces and D.R.B.), Fiscal Years 1960-61 and 1961-62

Department or Agency	1960-61					1961-62				
	Medicine	Agri-culture	Biology	Others	Total life sciences	Medicine	Agri-culture	Biology	Others	Total life sciences
thousands of dollars										
National Research Council	2,551	283	3,685	—	6,519	2,781	309	4,017	—	7,107
Atomic Energy:										
Atomic Energy Control Board	—	—	—	—	—	—	—	—	—	—
Atomic Energy of Canada Limited	—	—	461	—	461	—	—	594	—	594
Sub-totals	—	—	461	—	461	—	—	594	—	594
Agriculture:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Production and Marketing Branch—Health of Animals Division	422	—	—	—	422	593	—	—	—	593
Research Branch	—	22,903	—	—	22,903	—	24,092	—	—	24,092
Sub-totals	422	22,903	—	—	23,325	593	24,092	—	—	24,685
Board of Grain Commissioners—Grain Research Laboratory	—	130	—	—	130	—	165	—	—	165
External Affairs	—	—	—	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	—	—	—	—	—	—	—	—	—	—
Fisheries:										
Conservation and Development Service	—	—	237	—	237	—	—	261	—	261
Inspection Service	—	—	—	5	5	—	—	—	6	6
Industrial Development Service	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	237	5	242	—	—	261	6	267
Fisheries Research Board of Canada	—	—	3,451	194	3,645	—	—	3,999	225	4,224
Forestry:										
Forest Entomology and Pathology Branch	—	—	4,142	—	4,142	—	—	4,708	—	4,708
Forest Research Branch	—	2,705	142	—	2,847	—	3,144	166	—	3,310
Forest Products Research Branch	—	—	204	204	408	—	—	215	215	430
Sub-totals	—	2,705	4,488	204	7,397	—	3,144	5,089	215	8,448
Mines and Technical Surveys:										
Dominion Observatories Branch	—	—	—	—	—	—	—	—	—	—
Geographical Branch	—	—	—	—	—	—	—	—	—	—
Geological Survey of Canada Branch	—	—	—	—	—	—	—	—	—	—
Mines Branch	—	—	—	—	—	—	—	—	—	—
Polar Continental Shelf Project	—	—	—	—	—	—	—	—	—	—
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
National Film Board	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	4,813	—	—	—	4,813	5,057	—	—	—	5,057
Northern Affairs and National Resources:										
National Parks Branch	—	—	743	—	743	—	—	810	—	810
National Museum of Canada	—	—	120	—	120	—	—	163	—	163
Northern Co-ordination and Research Centre ..	—	—	—	39	39	—	—	—	52	52
Water Resources Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	863	39	902	—	—	973	52	1,025
Post Office-Engineering and Development Branch	—	—	—	—	—	—	—	—	—	—
St. Lawrence Seaway Authority	—	—	—	—	—	—	—	—	—	—
Transport:										
Air Services:										
Meteorological Branch	—	—	—	—	—	—	—	—	—	—
Telecommunications and Electronics Branch	—	—	—	—	—	—	—	—	—	—
Marine Services:										
Marine Works Branch	—	—	—	—	—	—	—	—	—	—
Shipbuilding Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
Veterans Affairs	354	—	—	—	354	384	—	—	—	384
Defence Production	—	—	—	—	—	—	—	—	—	—
Canadian Arsenal Ltd.	—	—	—	—	—	—	—	—	—	—
Totals	8,140	26,021	13,185	442	47,788	8,815	27,710	14,933	498	51,956

TABLE 3 C. Estimated Federal Government Expenditures on Scientific Activities, by Department or Agency and by Performing Organization, Fiscal Year 1964-65

Department or agency	Conduct of R & D ¹					All scientific activities				
	Performing organization				Total expenditures	Performing organization				Total expenditures
	Reporting unit	Profit organizations	Educational institutions	Others ²		Reporting unit	Profit organizations	Educational institutions	Others ²	
thousands of dollars										
Agriculture:										
Administration Branch—Information Division ..	—	—	—	—	—	457	—	—	—	457
Health of Animals Branch—Animal Pathology Division ..	940	—	—	—	940	1,130	—	—	—	1,130
Research Branch.....	25,036	—	145	—	25,181	31,538	—	145	—	31,683
Sub-totals.....	25,976	—	145	—	26,121	33,125	—	145	—	33,270
Board of Grain Commissioners—Grain Research Laboratory ..	342	—	—	—	342	430	—	—	—	430
Atomic Energy:										
Atomic Energy Control Board	—	—	1,250	—	1,250	—	—	1,250	—	1,250
Atomic Energy of Canada Limited	30,881	4,502	164	—	35,547	48,688	4,502	214	—	53,404
Sub-totals.....	30,881	4,502	1,414	—	36,797	48,688	4,502	1,464	—	54,654
Canadian Arsenals Limited.....	—	—	—	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation.....	32	13	—	51	96	32	13	—	51	96
Defence Production—Department of Industry.....	—	19,460	—	40	19,500	—	19,460	—	40	19,500
Fisheries:										
Conservation and Development Service.....	1,060	—	—	—	1,060	1,605	—	—	—	1,605
Industrial Development Service	607	—	10	85	702	633	—	10	85	728
Inspection Service	392	—	—	—	392	421	—	—	—	421
Sub-totals.....	2,059	—	10	85	2,154	2,659	—	10	85	2,754
Fisheries Research Board of Canada	6,465	—	45	—	6,510	8,158	—	50	—	8,208
Forestry:										
Administration Branch	—	—	58	1	59	—	600	58	1	659
Forest Entomology and Pathology Branch	3,423	—	—	—	3,423	6,637	—	—	—	6,637
Forest Products Research Branch	1,591	—	—	—	1,591	2,088	—	—	—	2,088
Forest Research Branch	2,876	—	—	—	2,876	3,303	—	—	—	3,303
Sub-totals.....	7,890	—	58	1	7,949	12,028	600	58	1	12,687
Medical Research Council.....	39	—	5,281	34	5,354	77	—	6,923	34	7,034
Mines and Technical Surveys:										
Dominion Observatories Branch	2,401	—	—	—	2,401	3,383	—	—	—	3,383
Geographical Branch	—	—	—	—	—	831	34	—	—	865
Geological Survey of Canada	4,025	—	100	—	4,125	6,762	1,937	100	—	8,799
Marine Sciences Branch.....	1,009	—	—	—	1,009	12,193	—	—	—	12,193
Mines Branch	5,013	—	50	—	5,063	6,797	—	50	—	6,847
Polar Continental Shelf Project	81	65	—	—	146	1,620	65	—	—	1,685
Surveys and Mapping Branch.....	—	—	—	—	—	7,089	—	—	—	7,089
Sub-totals.....	12,529	65	150	—	12,744	38,675	2,036	150	—	40,861
Dominion Coal Board	—	50	—	—	50	—	50	—	—	50
National Health and Welfare	2,037	—	2,118	1,428	5,583	3,468	—	2,428	1,428	7,324
National Research Council.....	27,638	2,700	13,126	432	43,896	35,374	2,900	16,367	886	55,527
Northern Affairs and National Resources:										
Canadian Wildlife Service.....	795	—	—	—	795	1,490	—	4	—	1,494
Northern Coordination and Research Centre....	—	—	85	35	120	156	—	85	35	276
Water Resources Branch	1,525	—	—	—	1,525	4,118	—	—	—	4,118
Sub-totals.....	2,320	—	85	35	2,440	5,764	—	89	35	5,888
Post Office—Engineering Branch	147	17	—	17	181	158	17	—	17	192
Secretary of State:										
National Film Board.....	42	—	—	—	42	42	—	—	—	42
National Museum.....	133	—	—	—	133	403	—	—	—	403
Patent and Copyright Office—Patent Division ..	—	—	—	—	—	2,922	—	—	—	2,922
Sub-totals.....	175	—	—	—	175	3,367	—	—	—	3,367
Transport:										
Civil Aviation Branch	8	—	—	—	8	8	—	—	—	8
Construction Branch.....	50	—	—	—	50	56	—	—	—	56
Marine Works Branch	108	—	—	—	108	468	—	—	—	468
Meteorological Branch	1,104	—	100	55	1,259	1,510	—	100	55	1,665
Telecommunications and Electronics Branch....	263	2,841	—	—	3,104	303	2,841	—	—	3,144
Sub-totals.....	1,533	2,841	100	55	4,529	2,345	2,841	100	55	5,341
Veterans Affairs	439	—	—	—	439	439	—	—	—	439
Totals, all departments and agencies except National Defence.....	120,502	29,648	22,532	2,178	174,860	194,787	32,419	27,784	2,632	257,622
National Defence:										
Armed Forces	17,601	12,492	—	789	30,882	23,336	12,492	—	939	36,767
Defence Research Board	29,071	5,959	1,840	416	37,286	30,993	5,959	1,890	416	39,258
Sub-totals.....	46,672	18,451	1,840	1,205	68,168	54,329	18,451	1,890	1,355	76,023
Totals, all departments and agencies.....	167,174	48,099	24,372	3,383	243,028	249,116	50,870	29,674	3,987	333,647

¹ Including grants in aid of research.

² Includes organizations such as hospitals, health foundations and provincial research institutes.

TABLE 4 A. Federal Government Expenditures on the Conduct of R & D¹ in the Life Sciences, by Department or Agency, by Scientific Field and by Type of R & D Activity, Fiscal Year 1962-63

Department or agency	Scientific field			Total, life sciences	Type of R & D activity		
	Agricultural sciences	Biological sciences	Medical sciences		Basic research	Applied research	Development
thousands of dollars							
Agriculture:							
Administration Branch—Information Division	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	795	—	—	795	—	795	—
Research Branch	24,003	—	—	24,003	4,800	18,963	240
Sub-totals	24,798	—	—	24,798	4,800	19,758	240
Board of Grain Commissioners—Grain Research Laboratory	330	—	—	330	152	158	20
Atomic Energy:							
Atomic Energy Control Board	—	—	—	—	—	—	—
Atomic Energy of Canada Limited	—	1,665	—	1,665	1,665	—	—
Sub-totals	—	1,665	—	1,665	1,665	—	—
Canadian Arsenals Limited	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	—	52	—	52	—	52	—
Defence Production—Department of Industry	—	—	—	—	—	—	—
Fisheries:							
Conservation and Development Service	—	602	—	602	—	120	482
Industrial Development Service	—	—	—	—	—	—	—
Inspection Service	—	297	—	297	—	—	297
Sub-totals	—	899	—	899	—	120	779
Fisheries Research Board of Canada	—	5,535	—	5,535	—	5,535	—
Forestry:							
Administration Branch	5	—	—	5	—	5	—
Forest Entomology and Pathology Branch	2,285	762	—	3,047	305	2,742	—
Forest Products Research Branch	—	170	—	170	—	170	—
Forest Research Branch	2,636	—	—	2,636	—	2,636	—
Sub-totals	4,926	932	—	5,858	305	5,553	—
Medical Research Council	—	—	3,644	3,644	3,644	—	—
Mines and Technical Surveys:							
Dominion Observatories Branch	—	—	—	—	—	—	—
Geographical Branch	—	—	—	—	—	—	—
Geological Survey of Canada	—	—	—	—	—	—	—
Marine Sciences Branch	—	—	—	—	—	—	—
Mines Branch	—	—	—	—	—	—	—
Polar Continental Shelf Project	—	—	—	—	—	—	—
Surveys and Mapping Branch	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—
Dominion Coal Board	—	—	—	—	—	—	—
National Health and Welfare	—	70	5,326	5,396	—	5,132	264
National Research Council	828	3,291	643	4,762	3,606	1,127	29
Northern Affairs and National Resources:							
Canadian Wildlife Service	—	596	—	596	60	238	298
Northern Coordination and Research Centre	—	30	—	30	—	30	—
Water Resources Branch	—	—	—	—	—	—	—
Sub-totals	—	626	—	626	60	268	298
Post Office—Engineering Branch	—	—	—	—	—	—	—
Secretary of State:							
National Film Board	—	—	—	—	—	—	—
National Museum	—	141	—	141	141	—	—
Patent and Copyright Office—Patent Division	—	—	—	—	—	—	—
Sub-totals	—	141	—	141	141	—	—
Transport:							
Civil Aviation Branch	—	8	—	8	—	8	—
Construction Branch	—	—	—	—	—	—	—
Marine Works Branch	—	—	—	—	—	—	—
Meteorological Branch	—	—	—	—	—	—	—
Telecommunications and Electronics Branch	—	—	—	—	—	—	—
Sub-totals	—	8	—	8	—	8	—
Veterans Affairs	—	—	410	410	—	410	—
Totals, all departments and agencies except National Defence	30,882	13,219	10,023	54,124	14,373	38,121	1,630
National Defence:							
Armed Forces	—	—	—	—	—	—	—
Defence Research Board	—	1,183	888	2,071	—	2,071	—
Sub-totals	—	1,183	888	2,071	—	2,071	—
Totals, all departments and agencies	30,882	14,402	10,911	56,195	14,373	40,192	1,630

¹ Includes grants in aid of research.

TABLE 4 B. Estimated Federal Government Expenditures on the Conduct of R & D¹ in the Life Sciences, by Scientific Field, and by Type of R & D Activity, Fiscal Year 1963-64

Department or agency	Scientific field			Total, life sciences	Type of R & D activity		
	Agricultural sciences	Biological sciences	Medical sciences		Basic research	Applied research	Development
	thousands of dollars						
Agriculture:							
Administration Branch—Information Division.....	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	858	—	—	858	—	858	—
Research Branch	24, 176	—	—	24, 176	4, 835	19, 099	242
Sub-totals	25, 034	—	—	25, 034	4, 835	19, 957	242
Board of Grain Commissioners — Grain Research Laboratory	325	—	—	325	150	156	19
Atomic Energy:							
Atomic Energy Control Board	—	—	—	—	—	—	—
Atomic Energy of Canada Limited	—	1, 804	—	1, 804	1, 804	—	—
Sub-totals	—	1, 804	—	1, 804	1, 804	—	—
Canadian Arsenals Limited	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	—	31	—	31	—	31	—
Defence Production—Department of Industry	—	—	—	—	—	—	—
Fisheries:							
Conservation and Development Service	—	629	—	629	—	126	503
Industrial Development Service	—	—	—	—	—	—	—
Inspection Service.....	—	301	—	301	—	—	301
Sub-totals	—	930	—	930	—	126	804
Fisheries Research Board of Canada.....	—	5, 831	—	5, 831	—	5, 831	—
Forestry:							
Administration Branch	24	—	—	24	—	24	—
Forest Entomology and Pathology Branch.....	2, 412	804	—	3, 216	322	2, 894	—
Forest Products Research Branch	—	173	—	173	—	173	—
Forest Research Branch.....	2, 740	—	—	2, 740	—	2, 740	—
Sub-totals	5, 176	977	—	6, 153	322	5, 831	—
Medical Research Council	—	—	4, 286	4, 286	4, 286	—	—
Mines and Technical Surveys:							
Dominion Observatories Branch	—	—	—	—	—	—	—
Geographical Branch.....	—	—	—	—	—	—	—
Geological Survey of Canada.....	—	—	—	—	—	—	—
Marine Sciences Branch	—	—	—	—	—	—	—
Mines Branch	—	—	—	—	—	—	—
Polar Continental Shelf Project	—	—	—	—	—	—	—
Surveys and Mapping Branch	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—
Dominion Coal Board	—	—	—	—	—	—	—
National Health and Welfare	—	123	5, 986	6, 109	—	5, 803	306
National Research Council	890	3, 810	851	5, 551	4, 029	1, 491	31
Northern Affairs and National Resources:							
Canadian Wildlife Service	—	740	—	740	74	296	370
Northern Coordination and Research Centre	—	35	—	35	—	35	—
Water Resources Branch.....	—	—	—	—	—	—	—
Sub-totals	—	775	—	775	74	331	370
Post Office—Engineering Branch.....	—	—	—	—	—	—	—
Secretary of State:							
National Film Board	—	—	—	—	—	—	—
National Museum	—	119	—	119	119	—	—
Patent and Copyright Office—Patent Division.....	—	—	—	—	—	—	—
Sub-totals	—	119	—	119	119	—	—
Transport:							
Civil Aviation Branch.....	—	8	—	8	—	8	—
Construction Branch	—	—	—	—	—	—	—
Marine Works Branch.....	—	—	—	—	—	—	—
Meteorological Branch	—	—	—	—	—	—	—
Telecommunications and Electronics Branch	—	—	—	—	—	—	—
Sub-totals	—	8	—	8	—	8	—
Veterans Affairs	—	—	420	420	—	420	—
Totals, all departments and agencies except National Defence.....	31, 425	14, 408	11, 543	57, 376	15, 619	39, 985	1, 772
National Defence:							
Armed Forces.....	—	—	—	—	—	—	—
Defence Research Board	—	1, 447	1, 086	2, 533	—	2, 533	—
Sub-totals	—	1, 447	1, 086	2, 533	—	2, 533	—
Totals, all departments and agencies	31, 425	15, 855	12, 629	59, 909	15, 619	42, 518	1, 772

¹ Includes grants in aid of research.

TABLE 4 C. Estimated Federal Government Expenditures on the Conduct of R & D¹ in the Life Sciences, by Scientific Field and by Type of R & D Activity, Fiscal Year 1964-65

Department or agency	Scientific field			Total, life sciences	Type of R & D activity		
	Agricultural sciences	Biological sciences	Medical sciences		Basic research	Applied research	Development
thousands of dollars							
Agriculture:							
Administration Branch—Information Division	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	940	—	—	940	—	940	—
Research Branch	25,181	—	—	25,181	5,036	19,893	252
Sub-totals	26,121	—	—	26,121	5,036	20,833	252
Board of Grain Commissioners—Grain Research Laboratory	342	—	—	342	157	164	21
Atomic Energy:							
Atomic Energy Control Board	—	—	—	—	—	—	—
Atomic Energy of Canada Limited	—	1,914	—	1,914	1,914	—	—
Sub-totals	—	1,914	—	1,914	1,914	—	—
Canadian Arsenals Limited	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	—	32	—	32	—	32	—
Defence Production—Department of Industry	—	—	—	—	—	—	—
Fisheries:							
Conservation and Development Service	—	636	—	636	—	127	509
Industrial Development Service	—	—	—	—	—	—	—
Inspection Service	—	314	—	314	—	—	314
Sub-totals	—	950	—	950	—	127	823
Fisheries Research Board of Canada	—	6,113	—	6,113	—	6,113	—
Forestry:							
Administration Branch	59	—	—	59	—	59	—
Forest Entomology and Pathology Branch	2,567	856	—	3,423	342	3,081	—
Forest Products Research Branch	—	191	—	191	—	191	—
Forest Research Branch	2,876	—	—	2,876	—	2,876	—
Sub-totals	5,502	1,047	—	6,549	342	6,207	—
Medical Research Council	—	—	5,354	5,354	5,354	—	—
Mines and Technical Surveys:							
Dominion Observatories Branch	—	—	—	—	—	—	—
Geographical Branch	—	—	—	—	—	—	—
Geological Survey of Canada	—	—	—	—	—	—	—
Marine Sciences Branch	—	—	—	—	—	—	—
Mines Branch	—	—	—	—	—	—	—
Polar Continental Shelf Project	—	10	—	10	10	—	—
Surveys and Mapping Branch	—	—	—	—	—	—	—
Sub-totals	—	10	—	10	10	—	—
Dominion Coal Board	—	—	—	—	—	—	—
National Health and Welfare	—	447	5,136	5,583	—	5,209	374
National Research Council	1,146	4,685	1,064	6,895	5,124	1,736	35
Northern Affairs and National Resources:							
Canadian Wildlife Service	—	795	—	795	80	318	397
Northern Coordination and Research Centre	—	60	—	60	—	60	—
Water Resources Branch	—	—	—	—	—	—	—
Sub-totals	—	855	—	855	80	378	397
Post Office—Engineering Branch	—	—	—	—	—	—	—
Secretary of State:							
National Film Board	—	—	—	—	—	—	—
National Museum	—	133	—	133	133	—	—
Patent and Copyright Office—Patent Division	—	—	—	—	—	—	—
Sub-totals	—	133	—	133	133	—	—
Transport:							
Civil Aviation Branch	—	8	—	8	—	8	—
Construction Branch	—	—	—	—	—	—	—
Marine Works Branch	—	—	—	—	—	—	—
Meteorological Branch	—	—	—	—	—	—	—
Telecommunications and Electronics Branch	—	—	—	—	—	—	—
Sub-totals	—	8	—	8	—	8	—
Veterans Affairs	—	—	439	439	—	439	—
Totals, all departments and agencies except National Defence	33,111	16,194	11,993	61,298	18,150	41,246	1,902
National Defence:							
Armed Forces	—	—	—	—	—	—	—
Defence Research Board	—	1,491	1,119	2,610	—	2,610	—
Sub-totals	—	1,491	1,119	2,610	—	2,610	—
Totals, all departments and agencies	33,111	17,685	13,112	63,908	18,150	43,856	1,902

¹ Includes grants in aid of research.

TABLE 5A. Federal Government Expenditures on the Conduct of R & D¹ in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1962-63

Department or agency	All engineering	Astronomy	Chemistry	Earth sciences	Metallurgy	Meteorology	Oceanography	Physics	Other	Total, physical sciences
thousands of dollars										
Agriculture:										
Administration Branch—Information Division	—	—	—	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	—	—	—	—	—	—	—	—	—	—
Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—	—	—
Atomic Energy:										
Atomic Energy Control Board	—	—	—	—	—	—	—	770	—	770
Atomic Energy of Canada Limited	22,092	—	—	—	—	—	—	5,436	—	27,528
Sub-totals	22,092	—	—	—	—	—	—	6,206	—	28,298
Canadian Arsenals Limited	412	—	—	—	—	—	—	—	—	412
Central Mortgage and Housing Corporation	3	—	—	—	—	—	—	—	—	3
Defence Production—Department of Industry	7,963	—	37	—	—	—	—	—	—	8,000
Fisheries:										
Conservation and Development Service	402	—	—	—	—	—	—	—	—	402
Industrial Development	634	—	—	—	—	—	—	—	—	634
Inspection Service	—	—	74	—	—	—	—	—	—	74
Sub-totals	1,036	—	74	—	—	—	—	—	—	1,110
Fisheries Research Board of Canada	—	—	—	—	—	—	404	—	—	404
Forestry:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Forest Entomology and Pathology Branch	—	—	—	—	—	—	—	—	—	—
Forest Products Research Branch	397	—	302	—	—	—	—	170	378	1,247
Forest Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	397	—	302	—	—	—	—	170	378	1,247
Medical Research Council	—	—	—	—	—	—	—	—	—	—
Mines and Technical Surveys:										
Dominion Observatories Branch	—	437	—	1,746	—	—	—	—	—	2,183
Geographical Branch	—	—	—	—	—	—	—	—	—	—
Geological Survey of Canada	—	—	229	3,430	—	—	—	152	—	3,811
Marine Sciences Branch	—	—	—	—	—	—	867	—	—	867
Mines Branch	1,382	—	587	279	2,144	—	—	476	—	4,868
Polar Continental Shelf Project	119	—	—	29	—	—	—	10	—	158
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	1,501	437	816	5,484	2,144	—	867	638	—	11,887
Dominion Coal Board	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	—	—	—	—	—	—	—	—	—	—
National Research Council	11,755	1,083	5,521	1,777	641	—	201	7,945	540	29,463
Northern Affairs and National Resources:										
Canadian Wildlife Service	—	—	—	—	—	—	—	—	—	—
Northern Coordination and Research Centre	—	—	—	30	—	—	—	—	—	30
Water Resources Branch	—	—	—	—	—	—	—	—	611	611
Sub-totals	—	—	—	30	—	—	—	—	611	641
Post Office—Engineering Branch	148	—	—	—	—	—	—	—	—	148
Secretary of State:										
National Film Board	29	—	—	—	—	—	—	—	—	29
National Museum	—	—	—	—	—	—	—	—	—	—
Patent and Copyright Office—Patent Division ..	—	—	—	—	—	—	—	—	—	—
Sub-totals	29	—	—	—	—	—	—	—	—	29
Transport:										
Civil Aviation Branch	—	—	—	—	—	—	—	—	—	—
Construction Branch	50	—	—	—	—	—	—	—	—	50
Marine Works Branch	83	—	—	—	—	—	—	—	—	83
Meteorological Branch	—	—	—	—	—	878	—	—	—	878
Telecommunications and Electronics Branch	258	—	—	—	—	—	—	—	—	258
Sub-totals	391	—	—	—	—	878	—	—	—	1,269
Veterans Affairs	—	—	—	—	—	—	—	—	—	—
Totals, all departments and agencies except National Defence	45,727	1,520	6,750	7,291	2,785	878	1,472	14,959	1,529	82,911
National Defence:										
Armed Forces	16,933	—	—	—	—	—	895	1,913	2,561	22,302
Defence Research Board	11,094	—	5,177	296	296	592	1,183	8,875	—	27,513
Sub-totals	28,027	—	5,177	296	296	592	2,078	10,788	2,561	49,815
Totals, all departments and agencies	73,754	1,520	11,927	7,587	3,081	1,470	3,550	25,747	4,090	132,726

¹ Includes grants in aid of research.

TABLE 5 B. Estimated Federal Government Expenditures on the Conduct of R & D¹ in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1963-64

Department or agency	All engineering	Astronomy	Chemistry	Earth sciences	Metallurgy	Meteor- ology	Oceano- graphy	Physics	Other	Total, physical sciences
thousands of dollars										
Agriculture:										
Administration Branch—Information Division	—	—	—	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	—	—	—	—	—	—	—	—	—	—
Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—	—	—
Atomic Energy:										
Atomic Energy Control Board	—	—	—	—	—	—	—	900	—	900
Atomic Energy of Canada Limited	23,197	—	—	—	—	—	—	7,092	—	30,289
Sub-totals	23,197	—	—	—	—	—	—	7,992	—	31,189
Canadian Arsenals Limited	355	—	—	—	—	—	—	—	—	355
Central Mortgage and Housing Corporation	12	—	—	—	—	—	—	—	—	12
Defence Production—Department of Industry	18,951	—	18	—	31	—	—	—	—	19,000
Fisheries:										
Conservation and Development Service	419	—	—	—	—	—	—	—	—	419
Industrial Development Service	609	—	—	—	—	—	—	—	—	609
Inspection Service	—	—	76	—	—	—	—	—	—	76
Sub-totals	1,028	—	76	—	—	—	—	—	—	1,104
Fisheries Research Board of Canada	—	—	—	—	—	—	386	—	—	386
Forestry:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Forest Entomology and Pathology Branch	—	—	—	—	—	—	—	—	—	—
Forest Products Research Branch	404	—	308	—	—	—	—	173	385	1,270
Forest Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	404	—	308	—	—	—	—	173	385	1,270
Medical Research Council	—	—	—	—	—	—	—	—	—	—
Mines and Technical Surveys:										
Dominion Observatories Branch	—	481	—	1,923	—	—	—	—	—	2,404
Geographical Branch	—	—	—	—	—	—	—	—	—	—
Geological Survey of Canada	—	—	240	3,600	—	—	—	160	—	4,000
Marine Sciences Branch	—	—	—	—	—	—	910	—	—	910
Mines Branch	1,401	—	594	282	2,173	—	—	481	—	4,931
Polar Continental Shelf Project	35	—	—	111	—	—	—	9	—	155
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	1,436	481	834	5,916	2,173	—	910	650	—	12,400
Dominion Coal Board	—	—	—	—	—	—	—	—	—	—
National Health and Welfare	—	—	—	—	—	—	—	—	—	—
National Research Council	13,203	1,133	6,250	1,810	748	—	253	8,512	620	32,529
Northern Affairs and National Resources:										
Canadian Wildlife Service	—	—	—	—	—	—	—	—	—	—
Northern Coordination and Research Centre	—	—	—	35	—	—	—	—	—	35
Water Resources Branch	—	—	—	—	—	—	—	—	1,007	1,007
Sub-totals	—	—	—	35	—	—	—	—	1,007	1,042
Post Office—Engineering Branch	215	—	—	—	—	—	—	—	—	215
Secretary of State:										
National Film Board	38	—	—	—	—	—	—	—	—	38
National Museum	—	—	—	—	—	—	—	—	—	—
Patent and Copyright Office—Patent Division ..	—	—	—	—	—	—	—	—	—	—
Sub-totals	38	—	—	—	—	—	—	—	—	38
Transport:										
Civil Aviation Branch	—	—	—	—	—	—	—	—	—	—
Construction Branch	50	—	—	—	—	—	—	—	—	50
Marine Works Branch	201	—	—	—	—	—	—	—	—	201
Meteorological Branch	—	—	—	—	—	1,056	—	—	—	1,056
Telecommunications and Electronics Branch	1,215	—	—	—	—	—	—	—	—	1,215
Sub-totals	1,466	—	—	—	—	1,056	—	—	—	2,522
Veterans Affairs	—	—	—	—	—	—	—	—	—	—
Totals, all departments and agencies ex- cept National Defence	60,305	1,614	7,486	7,761	2,952	1,056	1,549	17,327	2,012	102,062
National Defence:										
Armed Forces	18,940	—	—	—	—	—	695	1,521	2,783	23,939
Defence Research Board	13,568	—	6,332	362	362	724	1,447	10,854	—	33,649
Sub-totals	32,508	—	6,332	362	362	724	2,142	12,375	2,783	57,588
Totals, all departments and agencies	92,813	1,614	13,818	8,123	3,314	1,780	3,691	29,702	4,795	159,650

¹ Includes grants in aid of research.

TABLE 5 C. Estimated Federal Government Expenditures on the Conduct of R & D¹ in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1964-65

Department or agency	All engineering	Astronomy	Chemistry	Earth sciences	Metallurgy	Meteor- ology	Oceano- graphy	Physics	Other	Total, physical sciences
thousand of dollars										
Agriculture:										
Administration Branch—Information Division	—	—	—	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division	—	—	—	—	—	—	—	—	—	—
Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—	—
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—	—	—
Atomic Energy:										
Atomic Energy Control	—	—	—	—	—	—	—	1,250	—	1,250
Atomic Energy of Canada Limited	25,257	—	—	—	—	—	—	8,376	—	33,633
Sub-totals	25,257	—	—	—	—	—	—	9,626	—	34,833
Canadian Arsenals Limited	—	—	—	—	—	—	—	—	—	—
Central Mortgage and Housing Corporation	64	—	—	—	—	—	—	—	—	64
Defence Production—Department of Industry	19,370	—	40	—	90	—	—	—	—	19,500
Fisheries:										
Conservation and Development Service	424	—	—	—	—	—	—	—	—	424
Industrial Development Service	702	—	—	—	—	—	—	—	—	702
Inspection Service	—	—	78	—	—	—	—	—	—	78
Sub-totals	1,126	—	78	—	—	—	—	—	—	1,204
Fisheries Research Board of Canada	—	—	—	—	—	—	397	—	—	397
Forestry:										
Administration Branch	—	—	—	—	—	—	—	—	—	—
Forest Entomology and Pathology Branch	—	—	—	—	—	—	—	—	—	—
Forest Products Research Branch	446	—	339	—	—	—	—	191	424	1,400
Forest Research Branch	—	—	—	—	—	—	—	—	—	—
Sub-totals	446	—	339	—	—	—	—	191	424	1,400
Medical Research Council	—	—	—	—	—	—	—	—	—	—
Mines and Technical Surveys:										
Dominion Observatories Branch	—	552	—	1,849	—	—	—	—	—	2,401
Geographical Branch	—	—	—	—	—	—	—	—	—	—
Geological Survey of Canada	—	—	247	3,713	—	—	—	165	—	4,125
Marine Sciences Branch	—	—	—	—	—	—	1,009	—	—	1,009
Mines Branch	1,438	—	610	289	2,232	—	—	494	—	5,063
Polar Continental Shelf Project	10	—	—	97	—	—	—	29	—	136
Sub-totals	1,448	552	857	5,948	2,232	—	1,009	688	—	12,734
Dominion Coal Board	50	—	—	—	—	—	—	—	—	50
National Health and Welfare	—	—	—	—	—	—	—	—	—	—
National Research Council	14,314	1,276	7,370	2,585	947	—	325	9,077	1,107	37,001
Northern Affairs and National Resources:										
Canadian Wildlife Service	—	—	—	—	—	—	—	—	—	—
Northern Coordination and Research Centre	—	—	—	60	—	—	—	—	—	60
Water Resources Branch	—	—	—	—	—	—	—	—	1,525	1,525
Sub-totals	—	—	—	60	—	—	—	—	1,525	1,585
Post Office—Engineering Branch	181	—	—	—	—	—	—	—	—	181
Secretary of State:										
National Film Board	42	—	—	—	—	—	—	—	—	42
National Museum	—	—	—	—	—	—	—	—	—	—
Patent and Copyright Office—Patent Division	—	—	—	—	—	—	—	—	—	—
Sub-totals	42	—	—	—	—	—	—	—	—	42
Transport:										
Civil Aviation Branch	—	—	—	—	—	—	—	—	—	—
Construction Branch	50	—	—	—	—	—	—	—	—	50
Marine Works Branch	108	—	—	—	—	—	—	—	—	108
Meteorological Branch	—	—	—	—	—	1,259	—	—	—	1,259
Telecommunications and Electronics Branch	3,104	—	—	—	—	—	—	—	—	3,104
Sub-totals	3,262	—	—	—	—	1,259	—	—	—	4,521
Veterans Affairs	—	—	—	—	—	—	—	—	—	—
Totals, all departments and agencies ex- cept National Defence	65,560	1,828	8,684	8,593	3,269	1,259	1,731	19,582	3,056	113,562
National Defence:										
Armed Forces	25,717	—	—	—	—	—	704	1,427	3,034	30,882
Defence Research Board	13,982	—	6,525	373	373	746	1,491	11,186	—	34,676
Sub-totals	39,699	—	6,525	373	373	746	2,195	12,613	3,034	65,558
Totals, all departments and agencies	105,259	1,828	15,209	8,966	3,642	2,005	3,926	32,195	6,090	179,120

¹ Includes grants in aid of research.

TABLE 6. Federal Government Expenditures on the Conduct of R & D¹ in the Physical Sciences, by Department or Agency and by Type of R & D Activity, Fiscal Years 1962-63 to 1964-65

Department or agency	1962-63			1963-64 ²			1964-65 ²		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
thousands of dollars									
Agriculture:									
Administration Branch—Information Division ..	—	—	—	—	—	—	—	—	—
Health of Animals Branch—Animal Pathology Division ..	—	—	—	—	—	—	—	—	—
Research Branch	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	—	—	—	—	—	—	—
Board of Grain Commissioners—Grain Research Laboratory	—	—	—	—	—	—	—	—	—
Atomic Energy:									
Atomic Energy Control Board	770	—	—	900	—	—	1,250	—	—
Atomic Energy of Canada Limited	5,436	15,497	6,595	7,092	17,111	6,086	3,376	18,167	7,140
Sub-totals	6,206	15,497	6,595	7,992	17,111	6,086	9,626	18,167	7,140
Canadian Arsenals Limited	—	—	412	—	—	355	—	—	—
Central Mortgage and Housing Corporation	—	—	3	—	—	12	—	45	19
Defence Production—Department of Industry	—	—	8,000	—	—	19,000	—	—	19,500
Fisheries:									
Conservation and Development Service	—	80	322	—	84	335	—	85	339
Industrial Development Service	—	—	634	—	—	609	—	—	702
Inspection Service	—	—	74	—	—	76	—	—	78
Sub-totals	—	80	1,030	—	84	1,020	—	85	1,119
Fisheries Research Board of Canada	—	404	—	—	386	—	—	397	—
Forestry:									
Administration Branch	—	—	—	—	—	—	—	—	—
Forestry Entomology and Pathology Branch	—	—	—	—	—	—	—	—	—
Forest Products Research Branch	—	1,247	—	—	1,270	—	—	1,400	—
Forest Research Branch	—	—	—	—	—	—	—	—	—
Sub-totals	—	1,247	—	—	1,270	—	—	1,400	—
Medical Research Council	—	—	—	—	—	—	—	—	—
Mines and Technical Surveys:									
Dominion Observatories Branch	2,183	—	—	2,404	—	—	2,401	—	—
Geographical Branch	—	—	—	—	—	—	—	—	—
Geological Survey of Canada	1,334	2,439	38	1,400	2,560	40	1,444	2,640	41
Marine Sciences Branch	—	867	—	—	910	—	—	1,009	—
Mines Branch	925	1,996	1,947	942	2,002	1,987	967	2,056	2,040
Polar Continental Shelf Project	20	49	89	28	92	35	59	67	10
Surveys and Mapping Branch	—	—	—	—	—	—	—	—	—
Sub-totals	4,462	5,351	2,074	4,774	5,564	2,062	4,871	5,772	2,091
Dominion Coal Board	—	—	—	—	—	—	—	—	—
National Health and Welfare	—	—	—	—	—	—	—	—	—
National Research Council	14,632	12,025	2,806	16,333	13,250	2,946	19,432	14,576	2,993
Northern Affairs and National Resources:									
Canadian Wildlife Service	—	—	—	—	—	—	—	—	—
Northern Coordination and Research Centre	—	30	—	—	35	—	—	60	—
Water Resources Branch	—	611	—	—	1,007	—	—	1,525	—
Sub-totals	—	641	—	—	1,042	—	—	1,585	—
Post Office—Engineering Branch	—	—	148	—	—	215	—	—	181
Secretary of State:									
National Film Board	—	—	29	—	—	38	—	—	42
National Museum	—	—	—	—	—	—	—	—	—
Patent and Copyright Office—Patent Division ..	—	—	—	—	—	—	—	—	—
Sub-totals	—	—	29	—	—	38	—	—	42
Transport:									
Civil Aviation Branch	—	—	50	—	—	50	—	—	50
Construction Branch	—	83	—	—	201	—	—	108	—
Marine Works Branch	—	—	132	127	746	183	179	853	227
Meteorological Branch	125	621	232	—	122	1,093	—	310	2,794
Telecommunications and Electronics Branch	—	26	—	—	—	—	—	—	—
Sub-totals	125	730	414	127	1,069	1,326	179	1,271	3,071
Veterans Affairs	—	—	—	—	—	—	—	—	—
Totals, all departments and agencies except National Defence	25,425	35,975	21,511	29,226	39,776	33,060	34,108	43,298	36,156
National Defence:									
Armed Forces	—	3,084	19,218	—	2,481	21,458	—	2,438	28,444
Defence Research Board	—	27,513	—	—	33,649	—	—	34,676	—
Sub-totals	—	30,597	19,218	—	36,130	21,458	—	37,114	28,444
Totals, all departments	25,425	66,572	40,729	29,226	75,906	54,518	34,108	80,412	64,600

¹ Includes grants in aid of research.

² Preliminary estimates.

TABLE 7. Federal Government Expenditures on the Conduct of R & D¹ by Scientific Field and by Type of R & D Activity, Fiscal Years 1962-63 to 1964-65

Scientific field	1962-63			1963-64 ²			1964-65 ²		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
thousands of dollars									
Physical sciences:									
Engineering:									
Aeronautical	128	1,384	10,007	135	1,535	19,071	137	1,563	18,862
Chemical	310	1,688	466	361	2,011	426	461	2,181	432
Civil	176	1,487	746	283	1,560	319	420	1,680	342
Electrical and electronic	818	8,229	10,151	957	10,089	13,702	1,146	10,666	16,418
Hydraulic	81	1,126	505	86	1,409	528	87	1,353	534
Mechanical	505	4,988	4,062	637	5,654	5,474	693	5,955	11,109
Mining	—	164	789	—	172	805	—	204	876
Other	259	15,608	10,077	436	17,224	9,939	461	18,282	11,397
Sub-totals	2,277	34,674	36,803	2,895	39,654	50,264	3,405	41,884	59,970
Other physical sciences:									
Astronomy	1,275	245	—	1,355	259	—	1,560	268	—
Chemistry	4,496	7,296	135	4,903	8,794	121	5,572	9,490	147
Earth sciences	4,314	3,239	34	4,548	3,539	36	5,250	3,679	37
Mathematics	230	415	—	191	397	—	295	462	—
Metallurgy	565	1,639	877	633	1,755	926	699	1,933	1,010
Meteorology	125	1,213	132	127	1,470	183	179	1,599	227
Oceanography	201	3,210	139	253	3,306	132	325	3,446	155
Physics, nuclear	7,456	281	35	9,469	309	33	10,893	337	34
Physics, non-nuclear	4,176	13,371	428	4,423	15,031	437	5,117	15,366	448
Other	310	989	2,146	429	1,392	2,386	813	1,948	2,572
Totals, physical sciences	25,425	66,572	40,729	29,226	75,906	54,518	34,108	80,412	64,600
Life sciences:									
Agricultural sciences:									
Agronomy and animal husbandry	3,632	14,143	179	3,661	14,301	179	3,808	14,941	186
Forestry	152	4,773	—	161	5,023	—	171	5,362	—
Other	1,959	5,962	82	1,955	6,062	83	2,198	6,358	87
Sub-totals	5,743	24,878	261	5,777	25,386	262	6,177	26,661	273
Biological sciences	4,570	8,726	1,106	5,068	9,582	1,205	5,997	10,433	1,255
Medical sciences	4,060	6,588	263	4,774	7,550	305	5,976	6,762	374
Totals, life sciences	14,373	40,192	1,630	15,619	42,518	1,772	18,150	43,856	1,902
Totals, all scientific fields	39,798	106,764	42,359	44,845	118,424	56,290	52,258	124,268	66,502

¹ Includes grants in aid of research.

² Preliminary estimates.

TABLE 8. Personnel Employed by the Federal Government in the Conduct of R & D, by Field and Level of Training, as of 31 March 1963

Field of scientific training	All departments and agencies, except the Armed Forces				
	Level of training			Total employed	Full-time equivalent
	Bachelor	Master	Doctorate		
Physical sciences:					
Engineering:					
Aeronautical	11	24	4	39	39.0
Chemical	97	17	17	131	126.3
Civil	53	17	3	73	66.8
Electrical and electronic	171	67	27	265	251.5
Hydraulic	31	8	—	39	39.0
Mechanical	176	52	13	241	235.3
Other ¹	50	22	4	76	76.0
Sub-totals	589	207	68	864	833.9
Other physical sciences:					
Chemistry	162	60	253	475	469.0
Earth sciences	165	26	167	358	273.5
Mathematics	32	23	22	77	77.0
Metallurgy	44	15	24	83	82.3
Meteorology	6	30	2	38	38.0
Physics, nuclear	12	22	49	83	83.0
Physics, non-nuclear	129	95	172	396	395.5
Other ²	2	12	15	29	29.0
Totals, physical sciences	1,141	490	772	2,403	2,281.2
Life sciences:					
Agricultural sciences:					
Agronomy and animal husbandry	183	237	265	685	685.0
Forestry	69	85	76	230	229.3
Other	74	87	95	256	242.0
Sub-totals	326	409	436	1,171	1,156.3
Biological sciences	73	100	175	348	345.0
Medical sciences	147	67	113	327	136.0
Totals, life sciences	546	576	724	1,846	1,637.3
Administrators of R & D	86	48	123	257	248.3
Totals, all scientists and engineers	1,773	1,114	1,619	4,506	4,166.8
Supporting personnel:					
R & D technicians				4,498	3,931.2
Skilled craftsmen				1,665	1,644.2
Other supporting personnel				6,174	5,904.1
Totals, all supporting personnel				12,337	11,479.5
Total employed in R & D				16,843	15,646.3

¹ Includes mining engineers (16).

² Includes astromers (13) and oceanographers (14).

TABLE 9. Personnel Employed¹ by the Federal Government² in the Conduct of R & D, by Major Departments or Agencies, as of 31 March 1963

Department or agency	Professional personnel				Supporting personnel				Total
	Bachelor degree	Master degree	Doctorate	Total	Technicians	Skilled workers	Other	Total	
Agriculture	290	356	434	1,080	816	152	2,370	3,338	4,418
Atomic Energy of Canada Ltd.	247	62	100	409	587	895	630	2,112	2,521
Defence Research Board	218	164	166	548	592	96	1,150	1,838	2,386
Fisheries	101	65	67	233	463	7	201	671	904
Forestry	104	103	122	329	598	63	355	1,016	1,345
Mines and Technical Surveys	361	83	250	694	336	124	574	1,034	1,728
National Health and Welfare	95	58	110	263	234	—	41	275	538
National Research Council	181	144	349	674	636	297	759	1,692	2,366
Other	176	79	21	276	236	31	94	361	637
Totals	1,773	1,114	1,619	4,506	4,498	1,665	6,174	12,337	16,843

¹ Total numbers of personnel performing R & D and estimated administrative support staff. Includes seasonal staff and persons working part time only in R & D.

² Excluding the Armed Forces.

QUESTIONNAIRE

Complete in duplicate. Keep one copy for your files
and return one copy in the enclosed envelope to the
Dominion Bureau of Statistics, Ottawa.

FOR IMMEDIATE ATTENTION

DOMINION BUREAU OF STATISTICS

Business Finance Division

**FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES**

FISCAL YEAR 1962-63 ACTUAL
AND ESTIMATES 1963-64 AND 1964-65

This survey is being conducted in cooperation with the National Research Council, in an effort to assess the magnitude and direction of the federal government scientific program.

It is desired to publish the results of this survey in detail giving figures for each reporting unit. Permission is requested to consider all information reported on this form as available for publication. If your unit does not wish to give this permission please indicate in an accompanying letter.

Complete the questionnaire as fully as possible. If precise figures are not available, your best estimates will be satisfactory. Address enquiries to Business Finance Division, Dominion Bureau of Statistics.

Name of reporting unit _____

Name of person making this report _____ Telephone _____ Date _____
(Please print)

A. IDENTIFICATION OF FUNDS FOR SCIENTIFIC ACTIVITIES

Source of Funds	Funds		
	Actual expenditures 1962-63	Estimated expenditures 1963-64	Estimated expenditures 1964-65
1. Funds available as a result of annual estimates			
2. Cost of indirect support			
3. Transfers from other units of your dept. or agency (identify) _____			

4. Transfers from other depts. or agencies of the Federal Government (identify) _____			

5. Funds received from other sources (identify) _____			

Sub-totals			
Deduct:			
6. Transfers to other units of your dept. or agency (identify) _____			

7. Transfers to other depts. or agencies of the Federal Government (identify) _____			

8. Support provided non-scientific activities			
Sub-totals			
Total funds available			

A. IDENTIFICATION OF FUNDS

Definitions

Scientific activities — all activities in the natural sciences concerned with the creation of new knowledge, new applications of knowledge to useful purposes, or the furtherance of both the creation of new knowledge or new applications. Routine applications of scientific knowledge or skills are NOT included, except when these are related to the creation and furtherance of new knowledge or applications. The social and psychological sciences are NOT included in this survey.

If required at this time, definitions of the various types of scientific activity may be found in the definitions sections of questions B, C and D.

Instructions

A1 Funds available as a result of annual estimates. These are funds allotted to the department or agency by parliament. The 1962-63 expenditures would be the expenditures prepared for the Public Accounts by the department. The 1963-64 expenditures should be the sub-allotments when available, otherwise the estimates and supplementary estimates must be used. The 1964-65 expenditures are from the 1964-65 estimates.

A2 Cost of indirect support. This is mainly funds administered by other departments or agencies which are used for the benefit of your scientific activities. The departments involved are usually Public Works, Finance, Labour and the Post Office. Overhead costs at remote sites are to include net costs of requisite services such as housing, restaurants and utilities.

The relevant proportion of the value of the accommodation provided by your own department is also to be included.

A3 Transfers from other units of your dept. or agency. This includes all funds transferred from other units in support of your scientific activities. If this questionnaire is being completed at department or agency level this question is not applicable.

A4 Transfers from other depts. or agencies. These are funds received for the scientific activities of your organization from other departments or agencies.

A5 Funds received from other sources. These are mainly funds received as a result of sales or contracts and which are applied to the scientific activities of the unit, department or agency.

A6, A7 Transfers. All funds allocated to your organization which have been transferred to others within the Federal Government for scientific activities.

A8 Support provided non-scientific activities. Any portion of the funds shown in the answers to A1 to A5 which have been spent on non-scientific activities must be included here.

Time periods — The years 1962-63, 1963-64 and 1964-65 are the fiscal years April 1 to March 31.

General — If there is not sufficient space allowed for the names requested in A3 — A7, please put the total amount of the transfer in the applicable space and attach a separate sheet with the required names to your return.

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

Type of Scientific Activity	Performers					
	Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Other	Total
Actual expenditures 1962-63						
1. R & D costs						
2. Grants-in-aid of research						
Sub-totals						
3. Capital expenditures on R & D plant						
4. Capital expenditures on plant for other scientific activities						
5. Scientific data collection						
6. Scientific information						
7. Scholarship and fellowship programs						
Total expenditures						
Estimated expenditures 1963-64						
1. R & D costs						
2. Grants-in-aid of research						
Sub-totals						
3. Capital expenditures on R & D plant						
4. Capital expenditures on plant for other scientific activities						
5. Scientific data collection						
6. Scientific information						
7. Scholarship and fellowship programs						
Total expenditures						
Estimated expenditures 1964-65						
1. R & D costs						
2. Grants-in-aid of research						
Sub-totals						
3. Capital expenditures on R & D plant						
4. Capital expenditures on plant for other scientific activities						
5. Scientific data collection						
6. Scientific information						
7. Scholarship and fellowship programs						
Total expenditures						

Identify the following performers from the above reply.

	Actual expenditures 1962-63	Estimated expenditures 1963-64
1. The 5 profit organizations to which you made the largest payments for their performance of scientific activities -		
.....		
.....		
.....		
.....		
.....		
2. Educational institutions -		
.....		
.....		
.....		
Total payments to educational institutions		
3. Other non-profit institutions -		
.....		
.....		
.....		
Total payments to other non-profit institutions		
4. Others -		
.....		
.....		
Total payments to others		

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

Definitions

R & D — consists of basic research, applied research and development.

Research is investigative, experimental and generally original work undertaken primarily for the advancement of scientific knowledge. There may, or may not, be a specific practical application in view.

Development is the use of the results of research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. It includes the design, construction and testing of pilot plants and prototypes.

(More extensive notes on research and development are in the definitions of question C.)

Grants-in-aid of research — grants which are expressly designated as being in support of scientific research.

Capital expenditures — expenditures on land, buildings, facilities and major equipment used for either R & D or other scientific activities.

Reporting unit — any department or agency, or part of a department or agency, for which a questionnaire is completed.

Profit organization — Canadian business enterprises, research institutions and trade associations operated by industries for their own benefit, public utilities and other commercial-type corporations owned by Canadian governments.

Education institutions — Canadian universities and colleges.

Other non-profit institutions — institutions and foundations conducting some scientific activity and not primarily designed to make a profit or to provide profit organizations with research results.

Others — includes all foreign recipients of Federal Government funds for scientific activities, units of the Federal Government performing scientific activities for the reporting unit without a precedent transfer of funds (cf. A6 and A7), and units of provincial or municipal government receiving funds for scientific activities.

Instructions

B1 R & D costs. Include all expenditures which are attributable to R & D as defined above. Remember to include the costs of planning and administering R & D. Depreciation of capital equipment is NOT to be included here or elsewhere as a cost of R & D, nor is R & D into the social and psychological sciences to be considered.

B2 Grants-in-aid of research. Include the costs of administering such programs. The performer of such administration would be usually the reporting unit. The

performer of the research is normally an education institution or an industry (profit organization).

B3 Capital expenditures on R & D plant. Only the amounts estimated to be spent or actually spent during the years 1962-63, 1963-64 and 1964-65 are to be reported. Capital R & D expenditures for multi-purpose plant should be based on the proportion of the plant used for R & D.

B4 Capital expenditures on plant for other scientific activities. The expenditures on plant used for scientific data collection or the processing, indexing, cataloguing and dissemination of scientific information. When this plant is also used for other purposes, only the relevant proportion of capital expenditures may be given.

B5 Scientific data collection. This is the cost of collecting scientific data on natural phenomena. It includes data used for mapping; collection of geologic, hydrologic, geo-magnetic, meteorologic, astronomic and other physical data; and the collection of entomological specimens and other biologic data. Exclude data collection done in the course of carrying out a specific R & D project or program as this activity should be included under the conduct of R & D. Exclude also data collection done solely for internal operating purposes. If, however, these data are made available for general use, additional costs of material and personnel are to be included. The presentation of these data in reports, maps and other publications is included under the dissemination of scientific information described below.

B6 Scientific information. This includes the costs of library operations, translation, procurement and publication services in connection with information required in, or resulting from, scientific activities; standardization of terminology and the making of scientific or technical glossaries; and the support, including travel allowances, of scientific conferences and symposia.

B7 Scholarship and fellowship programs. Costs, including administrative costs, of scholarships and fellowships granted to persons who are or who will be engaged in a scientific activity. The reporting unit would normally be a performer in respect of the costs of its administration of such a program. An educational institution is normally the performer of the scientific activity.

General

(a) The row total of the column "total" must equal the total funds provided in question A for each of the years 1962-63, 1963-64 and 1964-65.

(b) If there is not sufficient spaces for you to name all the institutions performing scientific activities for you, please attach a separate sheet with a complete list.

(c) If you are aware that the recipient of funds for a scientific activity did not perform the activity but allocated it to some other performer, please complete this question for the **ultimate** performer.

C. FIELD OF RESEARCH

Field of Research	Actual expenditures 1962-63			Estimated expenditures 1963-64			Estimated expenditures 1964-65		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
Physical sciences:									
Engineering:									
Aeronautical									
Chemical									
Civil									
Electrical and electronic									
Hydraulic									
Mechanical									
Mining									
Other (identify)									
Totals, engineering									
Other physical sciences:									
Astronomy									
Chemistry									
Geology, geophysics and other earth sciences									
Mathematics									
Metallurgy									
Meteorology									
Oceanography									
Physics, nuclear									
Physics, non-nuclear									
Other (identify)									
Totals, all physical sciences									
Life Sciences:									
Agricultural sciences:									
Agronomy									
Animal husbandry									
Forestry									
Veterinary science									
Other (identify)									
Biological sciences:									
Biology, bio-chemistry, bio-physics									
Other (identify)									
Medical sciences:									
Dentistry									
Medicine									
Pharmacy									
Totals, all life sciences									
Totals, all fields of research									

C. FIELD OF RESEARCH

Definitions

Field of research — divided into two groups:

- (a) The **physical sciences**, which consist of those sciences concerned primarily with understanding the natural phenomena associated with non-living things: mathematics, pure and applied; and the engineering sciences, which are concerned with studies directed toward developing scientific principles usable in engineering practice.
- (b) The **life sciences**, which are those sciences dealing with the physical processes and characteristics of all living matter. They include agriculture, which is directed toward understanding and improving agricultural productivity; the biological sciences, which study the life processes and classify living organisms; and medicine, which comprises those sciences that, apart from the strictly clinical aspects of professional medicine, are concerned primarily with the utilization of scientific principles in understanding human diseases and in maintaining and improving human health.

Basic research is work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view.

Applied research is work undertaken primarily, for the advancement of scientific knowledge, but with a specific practical aim in view.

Practical distinctions between basic and applied research may be based on the **aim**, the **method** and the **results** of the research.

The aims of basic and applied research are different. The aim of basic research is to satisfy curiosity or to extend theoretical knowledge; the object of applied research is to solve a particular problem, to improve an existing product or process or to enable a discovery or existing knowledge to be used in a specific situation or area.

The methods of research will often be different. In basic research the investigators will be less restricted in the subject and direction of their work than will be the case in applied research. Basic research is probably conducted as an individual project rather than a group project often than is the case in applied research.

The results of the two types of research may well be different. The findings of a basic research project are more likely to have a broad, fundamental significance. They may lead to a multiple number of applications, whereas the results of applied research will often be of use only to a particular area or project.

Development is the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. Difficulty is often experienced in distinguishing between development and production costs.

The criterion must be the reason for which the work is undertaken. If the primary aim is to improve the quality of the product or process, the relevant expenditures are for development. If the primary motive is to get the production process set up, the work is NOT development.

The design, construction and testing of prototypes is R & D, but the costs of trial production runs are NOT development costs. After an original prototype has been successfully tested and no more development work is required, limited scale manufacture of the item, even though they may still be called "prototypes", cannot be included in development.

The cost of changes in design made necessary because of changed fashions or styles unaccompanied by technological innovation is NOT R & D.

Once the experimental phase of a pilot plant is over, it may be operated as a productive unit. As soon as the primary purpose in operating a pilot plant is for production, the costs of operation may no longer be attributed to development.

Instructions

General — The R & D expenditures to be considered in this question are the total R & D current expenditures of question B (i.e. B1 and B2). Hence the sum of total expenditures of each of the three components of R & D in this question must equal the total of B1 and B2.

In many cases you may have to ask for estimates of field of research and type of work from the scientists employed on R & D. Unless there are particularly heavy expenditures on some experimental apparatus or material, this method will yield a sufficiently accurate break-down of R & D for this question.

If your unit, department or agency has an accounting system that will supply you with more accurate figures, or if the directors of the R & D program can make a more exact estimate, please disregard the above suggestion.

D. FIELD OF APPLICATION

1. Application expected to benefit industry directly.

Industry	Application costs					
	Actual expenditures 1962-63		Estimated expenditures 1963-64		Estimated expenditures 1964-65	
	%	Amount	%	Amount	%	Amount
Mines, quarries and oil wells						
Food and beverage						
Rubber						
Textile						
Wood						
Furniture and fixtures						
Paper and allied industries						
Primary metal						
Metal fabricating						
Machinery						
Aircraft and parts						
Other transportation equipment						
Electrical products						
Non-metallic mineral products						
Petroleum and coal products						
Chemical and chemical products						
Professional and scientific equipment						
Transportation, storage, communication and other utilities						
Construction						
Other (identify)						
.....						
.....						
Totals, application for industry						

2. Application not expected to aid industry directly.

Field of Science						
Military science						
Nuclear science						
Space travel and communications						
Life sciences:						
Agricultural						
Biological						
Medical						
Physical sciences (identify)						
.....						
.....						
.....						
Totals, application not for industry						
Total application costs						

D. FIELD OF APPLICATION

Definitions

Field of application - the economic area or scientific field expected to benefit from the application of the results of research.

Industry - the industries are defined as follows:

a) **Mines, quarries and oil wells** - companies primarily engaged in both mineral and non-mineral mining, the extraction of mineral fuels, the operation of quarries and sand pits, or the provision of certain services to these operations.

b) **Food and beverage** - companies primarily engaged in preparing food and beverage materials for consumption.

c) **Rubber** - companies primarily engaged in manufacturing all kinds of natural or synthetic rubber products.

d) **Textile** - companies primarily engaged in preparing thread, yarn or fabrics made of cotton, wool or synthetic materials; in the processing of fibres and felt; in the manufacture of cordage, carpets, cloth bags and coated fabrics such as linoleum; and in the dyeing and finishing of fabrics.

e) **Wood** - companies primarily engaged in producing lumber and wood basic materials, and manufacturing finished articles made entirely or mainly of wood.

f) **Furniture and fixtures** - companies primarily engaged in the manufacture of furniture and fixtures for the household, office or school, regardless of the materials used.

g) **Paper and allied industries** - companies primarily engaged in the manufacture of pulp either from wood or other fibres, conversion of these pulps into any kind of paper or paper board, or the manufacture of paper and paper board into converted products such as asphalt shingles or fibre tubes.

h) **Primary metal** - includes iron and steel mills, steel pipe and tube mills, iron foundries, and companies primarily engaged in smelting and refining ores, or in rolling, casting and extruding metals.

i) **Metal fabricating** - companies primarily engaged in fabricating structural steels; in stamping, pressing and coating sheet metal; in manufacturing ornamental metal products, wire and wire products, hardware, tools and cutlery, and heating equipment. Machine shops, boiler and plate works are also included.

j) **Machinery** - companies primarily engaged in manufacturing agricultural implements, commercial refrigeration and air conditioning equipment, office and store machinery, and machinery and equipment used for construction, mining, processing and manufacturing.

k) **Aircraft and parts** - companies primarily engaged in manufacturing, assembling or repairing aircraft and parts.

l) **Other transportation equipment** - companies primarily engaged in manufacturing or assembling motor vehicles, railroad rolling stock, ships and boats, or in the repair of all of the above items except motor vehicles.

m) **Electrical products** - companies primarily engaged in the manufacture of electrical machinery and appliances, communication equipment, and other electrical products such as electric wires, batteries, fixtures, computers and data processors.

n) **Non-metallic mineral products** - companies primarily engaged in the manufacture of articles made entirely or mainly of non-metallic minerals such as cement, asbestos, clay, glass, stone and concrete, or in the preparation of such materials.

o) **Petroleum and coal products** - companies primarily engaged in refining crude petroleum, and in manufacturing petroleum and coal products.

p) **Chemical and chemical products** - companies primarily engaged in manufacturing industrial chemicals, medicinal and pharmaceutical preparations, soaps and washing compounds, paints and varnishes and miscellaneous chemicals including fertilizers, sweeping compounds, adhesives, polishes and dressings.

q) **Scientific and professional equipment** - companies primarily engaged in manufacturing instruments and equipment used in scientific apparatus or laboratories, or used by professions such as medicine, dentis-

try, photography and engineering. Miscellaneous equipment such as eye glasses, artificial limbs, bomb sights and range finders are also included.

r) **Transportation, storage, communication and other utilities** - companies primarily engaged in the operation of air, land or water transportation services, in the storage of grain and other commodities, in the operation and maintenance of communication systems, or in providing utilities such as electric power, gas, water and steam.

s) **Construction** - contractors engaged in the construction of buildings, highways, bridges and utilities.

Field of science - the definitions are as follows:

a) **Nuclear science** includes both nuclear physics and nuclear energy. Work directed toward the creation or improvement of instruments, equipment and buildings used in the production, investigation, control and utilization of nuclear energy is included, as are all programs to provide devices and clothing designed for protection against the effects of releases of nuclear energy. The utilization of nuclear science for military purposes is to be included.

b) **Space travel and communications** include the conception, design, construction and launching of space vehicles, the communications between such vehicles and the earth or with other vehicles, and the exploration of non-terrestrial phenomena by means of such vehicles or communications.

Work on the materials and fuels required for space vehicles or the protection of passengers is included, as is work on missiles not intended for space but using similar designs or fuel. All space travel and communications are covered, whether or not there are military applications of the equipment or techniques. Astronomy and earth-to-earth communications are NOT included.

c) **Military science** covers all projects undertaken primarily because of their military implications, but excluding all such work in the fields of nuclear science or space travel and communications. When a project or study is of interest to both the civil and military authorities the criteria should be:

- (1) the degree of security imposed,
- (2) the source of funds, and
- (3) the amount of cooperation with other civil and military units or programs.

d) **Life and physical sciences** and defined in question C above.

Instructions

General - the total amount assigned to application must be the sum of the totals of applied research and development (question C).

The percentage required in the two small columns is the percentage of total application costs spent for that industry or field of science. Hence the percentage of "Total application costs" at the bottom of question D must be 100.

Industry vs Field of Science - the costs of application are to be entered in D1 when the application is expected to aid industry directly. Examples might be the preservation of foods, the development of new metal alloys, or experiments in construction in the Arctic. The costs of R & D contracts from an industry or firm are, of course, to be entered in D1. If you are not certain of the industry but are working for a particular firm, you may supply the name of the firm instead of the industry. Indirect benefits to industry, such as payments to the electrical products industry for work performed on space vehicles, are NOT to be considered in D1.

In section D2, when assigning the cost of an application not expected to benefit industry directly, you must decide the primary reason for the project. For example, work on the chemical properties of war gases would normally be considered as a project in the field of military sciences. However, if the same gas were being developed as a plant spray it would probably be included as an application in agricultural science. In neither case would it be considered as being undertaken for the benefit of the chemical industry.

E. PERSONNEL EMPLOYED IN R & D

The number of persons engaged in the conduct of R & D in your unit, department or agency as of 31 March 1963.

1. Scientists and engineers

Field of Training	Level of training			Total number employed	Full-time equivalent
	Bachelor	Master	Doctorate		
Physical scientists:					
Aeronautical engineering					
Chemical					
Civil					
Electrical and electronic					
Hydraulic					
Mechanical					
Mining					
Other engineering (identify)					
.....					
Sub-totals					
Astronomy					
Chemistry					
Geology, geophysics and other earth sciences					
Mathematics					
Metallurgy					
Meteorology					
Oceanography					
Physics, nuclear					
Physics, non-nuclear					
Others (identify)					
.....					
Totals, physical scientists					
Life scientists:					
Agricultural sciences:					
Agronomy					
Animal husbandry					
Forestry					
Veterinary science					
Other (identify)					
.....					
Biological sciences:					
Biology, bio-chemistry, bio-physics					
Other (identify)					
.....					
Medical sciences:					
Dentistry					
Medicine					
Pharmacy					
.....					
Totals, life scientists					
Administrators of R & D					
Totals, all scientists and engineers					

2. Supporting personnel

	Total number	Full-time equivalent
R & D technicians		
Skilled craftsmen		
Other supporting personnel		
Total, supporting personnel		

E. PERSONNEL EMPLOYED IN R & D

Definitions

Field of training — the branch of engineering or the field of science in which each person in your organization, engaged in the conduct or administration of R & D, trained in preparation for his highest academic degree or professional qualification.

Level of training — the highest academic degree of each of the persons engaged in the conduct or administration of R & D. Those employed as scientists and engineers who do not have a university degree but possess an equivalent diploma or who have the qualifications required for admission to their professional society will normally be considered as being at the bachelor level of training.

Full-time equivalent — full-time employment on scientific activities is considered as being about 30 hours (or more) a week, excluding normal holidays. This time need not be spent only in the laboratory or project area, but might include time spent in administering R & D, using the library or recruiting other R & D workers. For example, a scientist who normally spends 40 hours a week on such activities is considered one full-time unit, but two scientists, each devoting 20 hours a week to R & D, would be considered one and one-third full-time units.

Supporting personnel — there are three classes of supporting personnel.

a) **R & D Technicians** are technical personnel having high school graduation or equivalent and with additional technical training, who assist scientists and engineers in R & D work (e.g. draughtsmen, laboratory assistants, electronic technicians).

b) **Skilled craftsmen** are workers in positions requiring specialized training or experience and who are engaged in R & D work (e.g. glass blowers, machinists, model makers).

c) **Other supporting personnel** are all other persons whose pay is included in the direct cost of the conduct of R & D or the administration of grants-in-aid of research (e.g. clerical staff and apprentices, but NOT janitors or canteen attendants).

Instructions

Full-time equivalent — to derive the full-time equivalent, it is recommended that you first consider how many people are employed full time in the conduct or administration of R & D, and then add an estimate of the full-time equivalent of the remainder.

Administrators of R & D — do not consider their field of training but describe them only by their highest degree or professional qualification.

Seasonal staff — if the employment in R & D within your unit, department or agency varied by more than 10% during the fiscal year 1962-63, please estimate the deviation from the figure for March 31, 1963.

(a) If there was a total employment in R & D of 90% or less of the March 31 employment during 1962-63, please estimate the average number of R & D workers, professionals and supporting personnel, employed during the year.

(b) If the total employment exceeded the March 31 figure by 10% or more, estimate, on a separate sheet of paper, the man-year equivalent of the excess (presumably seasonal staff). Consider one year as equal to 48 weeks. Give this man-year equivalent for the applicable fields of training for those employed as professionals. Do not break down the figures by level of training. Also give the man-year equivalent for those who were employed as supporting personnel. Do not break down this estimate into the three classes of supporting personnel. For example, if your organization hired 15 chemistry undergraduates for R & D for the period May 15 to September 1, of whom 10 were used at the professional level and 5 were employed as supporting personnel, the correct man-year estimates would be 2.75 man-years at the professional level for the field of training of chemistry and 1.38 man-years for supporting personnel.

NOTE: Only personnel engaged in the conduct or administration of R & D are to be considered. Do NOT include personnel engaged in the other scientific activities.

F. GENERAL AREA OF R & D

1. Current expenditures on R & D

Area	Actual expenditures 1962-63		Estimated expenditures 1963-64		Estimated expenditures 1964-65	
	%	Amount	%	Amount	%	Amount
Nuclear science						
Space travel and communications						
Military science (excluding nuclear and space)						
Other projects						
Total R & D current expenditures						

2. Capital expenditures on R & D

Area	Actual expenditures 1962-63		Estimated expenditures 1963-64		Estimated expenditures 1964-65	
	%	Amount	%	Amount	%	Amount
Nuclear science						
Space travel and communications						
Military science (excluding nuclear and space)						
Other projects						
Total R & D capital expenditures						

Instructions

1. The definitions to be used are those of question D.
2. The total R & D current expenditures must equal the sum of the totals of R & D costs and grants-in-aid of research of question B.
3. "Other projects" is merely the difference between total R & D current or capital expenditures, and the sum of nuclear science, space travel and communications, and military science.
4. Capital equipment does not include equipment such as missiles or space vehicles, which since they will be used only once, are considered current expenditures.
5. The first half of this question, F1, differs from question D only that basic research is now included.
6. In F2, "Total R & D capital expenditures" must equal the totals of question B3.
7. The percentage of the totals of both current and capital expenditures on R & D must be 100.



attention

FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1964-65

DÉPENSES DU GOUVERNEMENT FÉDÉRAL AU
TITRE DE L'ACTIVITÉ SCIENTIFIQUE

EXERCICE 1964-65

DOMINION BUREAU OF STATISTICS

BUREAU FÉDÉRAL DE LA STATISTIQUE

DOMINION BUREAU OF STATISTICS — BUREAU FÉDÉRAL DE LA STATISTIQUE

Business Finance Division — Division des finances des entreprises

Scientific Activities Surveys Section — Section des enquêtes sur l'activité scientifique

FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1964-65

DÉPENSES DU GOUVERNEMENT FÉDÉRAL AU
TITRE DE L'ACTIVITÉ SCIENTIFIQUE

EXERCICE 1964-65

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PREFACE

This report is the fourth in the biennial series "Federal Government Expenditures on Scientific Activities". It presents in tabular form estimates of various aspects of the scientific activities financed by the Federal Government in 1964-65 and 1965-66. These estimates were derived from a survey of government departments and agencies carried out from November 1965 to June 1966.

The data cover programmes in the physical and life sciences, but not those in the social sciences. Scientific activities comprise research and development, grants in aid of research, collection of scientific data and the processing and dissemination of scientific information. Scholarships and fellowships for students working in these sciences are also included.

Concepts and definitions were prepared with the aid of officials of the National Research Council and are in accordance with the recommendations of the Organization for Economic Cooperation and Development.

The assistance of the departments and agencies of the Federal Government who have co-operated by participating in the survey is gratefully acknowledged.

WALTER E. DUFFETT,
Dominion Statistician.

PRÉFACE

Le présent rapport est le quatrième d'une série bisannuelle intitulée: "Dépenses du gouvernement fédéral au titre de l'activité scientifique". Il présente sous forme de tableaux des estimations portant sur divers aspects de l'activité scientifique financée par le gouvernement fédéral en 1964-65 et 1965-66. Ces estimations ont été tirées d'un relevé des organismes et services gouvernementaux, de novembre 1965 à juin 1966.

Les données visent les programmes en sciences physiques et de la vie, mais non en sciences sociales. L'activité scientifique englobe la recherche et le développement, les subventions d'appoint pour la recherche, la réunion des données scientifiques, ainsi que le traitement et la diffusion de l'information scientifique. Les bourses d'étudiants et d'associés poursuivant des travaux dans ces domaines en particulier sont aussi incluses.

Les concepts et définitions ont été rédigés en collaboration avec les directeurs du Conseil national de recherches et conformément aux recommandations de l'Organisation pour la coopération et le développement économiques.

Nous tenons à exprimer ici notre reconnaissance aux autorités des organismes et services du gouvernement fédéral qui nous ont été d'un précieux secours en participant au relevé.

WALTER E. DUFFETT,
Statisticien du Dominion.

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GENERAL REVIEW

Total Expenditures

The total expenditures of the Federal Government on scientific activities are estimated to have been almost \$400 million in 1965-66. This is an increase of 19 per cent over the 1964-65 level. As shown in the table below, five departments or agencies account for the bulk of these expenditures. However, their share of total expenditures has fallen from about 91 per cent in 1958-59 to about 75 per cent in 1965-66. The Department of National Defence continues to be the largest individual spender — over 20 per cent of the total.

Major Sources of Funds for Scientific Activities

Sources principales des fonds affectés à l'activité scientifique

Department or agency — Ministère ou organisme	1962-63 ¹	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Agriculture	29.6	30.6	33.4	39.4
Atomic Energy of Canada Limited	38.6	45.6	53.1	55.4
Mines and Technical Surveys ³ — Mines et Relevés techniques ³	42.4	42.3	43.6	51.2
National Defence — Défense nationale	59.4	70.2	69.9	85.9
National Research Council — Conseil national de recherches	40.4	47.3	53.8	66.7
All others — Tous autres	46.6	61.9	78.0	97.6
Total	257.0	297.9	331.8	396.2

¹ Revised.

² Estimated.

³ Including Water Resources Branch, which was formerly part of the Department of Northern Affairs and National Resources.

¹ Révisé.

² Évalué.

³ Y compris Direction des ressources hydrauliques qui faisait autrefois partie du ministère du Nord canadien et des Ressources nationales.

Classes of Scientific Activities

At present, statistics are compiled on four scientific activities: research and development, scientific data collection, scientific information and support of individuals studying in the life and physical sciences at educational institutions. Data are also collected on capital expenditures on plant for these activities.

The conduct of research and development is the most important single activity, accounting for about 85 per cent of the total current expenditures over the four years shown. Furthermore, most of the capital expenditures are for the provision of R & D plant and equipment.

It should be noted that so far as possible, amounts shown for scholarship and fellowship programmes include only those intended to assist the scientific education of the recipients. Grants which may be designated as scholarships or fellowships but which are intended to support the

REVUE GÉNÉRALE

Dépenses totales

Le gouvernement fédéral a dépensé approximativement 400 millions de dollars en activités scientifiques en 1965-66, augmentation de 19 p. 100 sur 1964-65. Le tableau ci-dessous révèle que cinq ministères ou organismes se partagent le gros de ces dépenses. Leur part, toutefois, a fléchi d'environ 91 p. 100 à environ 75 p. 100 entre 1958-59 et 1965-66. Le ministère de la Défense nationale demeure le plus actif; il compte pour plus de 20 p. 100 des dépenses totales.

Classes d'activités scientifiques

Les statistiques s'établissent actuellement à l'égard de quatre initiatives scientifiques: recherche et développement, réunion de données scientifiques, information scientifique, et aide aux étudiants des sciences de la vie et des sciences physiques dans les établissements d'enseignement. Des données sont aussi recueillies sur les immobilisations en installations afférentes à ces initiatives.

La poursuite de la recherche et du développement est l'activité la plus importante; elle répond pour environ 85 p. 100 des dépenses courantes totales au cours des quatre années observées. De surcroît, la majeure partie des investissements va à l'installation et à l'équipement de R & D.

Il faut observer que dans la mesure du possible les sommes indiquées à l'égard des programmes de bourses d'études et universitaires comprennent seulement les sommes destinées à aider les bénéficiaires dans leurs études. Les subventions qu'on pourrait désigner du nom de bourses d'études ou

recipient in a research project are considered to be funds for R & D.

bourses universitaires mais dont l'objet est d'aider le bénéficiaire dans un projet de recherche sont considérées comme des fonds de R & D.

Expenditures by Scientific Activity

Dépenses par activité scientifique

Scientific activity — Activité scientifique	1962-63 ¹	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Research and development—Recherche et développement	191.7	222.2	240.7	294.0
Scientific data collection—Réunion des données scientifiques	24.1	25.6	24.4	25.3
Scientific information—Information scientifique	9.7	10.1	12.8	14.5
Scholarships and fellowships — Bourses (d'études et universitaires)	2.6	2.8	3.8	5.5
Capital expenditures ³ —Investissements ³	28.9	37.2	50.2	56.8
Total⁴	257.0	297.9	331.8	396.2

¹ Revised.

² Estimated.

³ Much of the data on the capital expenditures of the Canadian Forces is not available.

⁴ Totals may not add exactly due to rounding.

¹ Révisé.

² Évalué.

³ Une bonne partie des données sur les investissements des Forces canadiennes n'est pas disponible.

⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Performers of R & D

Most of the funds provided by the Federal Government for scientific research and development continue to be spent for work performed in its own establishments. However, an increasing proportion of R & D funds seems to be used in support of extra-mural R & D. For example, in 1962-63 almost 79 per cent of such funds was allocated to intra-mural R & D, whereas the proportion was expected to be only about 62 per cent in 1965-66. In the past, though, there have been substantial fluctuations in such ratios. The relative shares of both industry and educational institutions have been increasing over this period—that of industry has more than doubled while the share of educational institutions has risen by about 40 per cent.

Exécutants de la R & D

La majeure partie des fonds affectés par le gouvernement fédéral à la recherche et au développement scientifiques va aux travaux exécutés dans ses propres établissements. Toutefois, une proportion croissante des fonds de R & D semble passer au soutien de la R & D à l'extérieur. En 1962-63, par exemple, près de 79 p. 100 des fonds sont allés à des travaux de R & D *intra-muros* tandis qu'en 1965-66, cette proportion n'est que de 62 p. 100. Dans le passé, cependant, ces proportions ont fluctué considérablement. La part relative de l'industrie et des établissements d'enseignement a été croissante durant la période; celle de l'industrie a plus que doublé et celle des établissements d'enseignements a augmenté de 40 p. 100 environ.

Performers of Research and Development

Exécutants de la recherche et du développement

Performers — Exécutants	1962-63 ¹	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Federal Government—Gouvernement fédéral	151.2	162.3	165.3	181.9
Canadian industry—Industrie canadienne	20.2	35.9	45.0	69.7
Educational institutions—Établissements d'enseignement	17.3	20.0	26.8	37.9
Others ³ —Autres ³	3.0	4.0	3.6	4.4
Total⁴	191.7	222.2	240.7	294.0

¹ Revised.

² Estimated.

³ Includes other governments, private non-profit institutions and foreign recipients.

⁴ Totals may not add exactly due to rounding.

¹ Révisé.

² Évalué.

³ Y compris autres gouvernements, organismes privés sans but lucratif et bénéficiaires étrangers.

⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

The Federal Government supports R & D performed by industry in several ways¹. The Defence Development Sharing Programme, funded by the Department of Industry, is the largest programme (almost \$23 million in 1965-66). It is intended to "sustain and improve the development capabilities of Canadian companies active in the military product field".

The Defence Research Board administers the Defence Industrial Research Programme, which is expected to have spent a little over \$5 million in 1965-66. It is designed to "improve the ability of Canadian companies to compete for research, development, and ultimately production contracts in the United States and NATO defence markets".

In 1965-66 the Industrial Research Assistance Programme of the National Research Council was believed to have cost about \$3.4 million. This programme has two objectives: first, "to create new research facilities within industrial companies and to expand existing facilities", and second, "to improve communications between research workers in Government and industrial laboratories".

A Programme for the Advancement of Industrial Technology has recently been authorized, and in 1965-66, its first year of operation, cost almost \$1 million. Administered by the Department of Industry, it is intended "to help industry help itself to improve its technological capacity and to expand its innovation activity by underwriting development projects which involve a genuine technical advance and which, if successful, offer good prospects for commercial exploitation".

It should be noted that in all these programmes both the Government and industry share the project costs. In general, it would seem that the Government pays approximately half the cost of the sponsored projects.

Industrial research and development are also aided by contracts for R & D, or for new equipment and materials which require firms to first perform a certain amount of R & D. These contracts are often placed with Canadian firms to encourage them to develop the appropriate facilities and skills needed to enable them to exploit discoveries of Government laboratories.

Le gouvernement fédéral encourage la R & D dans l'industrie de diverses façons¹. Le programme d'aide aux travaux de développement pour la défense, subventionné par le ministère de l'Industrie, est le plus important; il a coûté près de 23 millions de dollars en 1965-66. Il est conçu en vue de "permettre aux sociétés canadiennes productrices de matériel militaire de maintenir ou d'accroître leur capacité de poursuivre des travaux de développement".

Le Conseil de recherches pour la défense administre le programme de recherches industrielles pour la défense, qui aura coûté probablement en 1965-66 un peu plus de 5 millions de dollars. Il a pour but "de renforcer la position des entreprises canadiennes dans la concurrence pour les contrats de recherche, de développement et, éventuellement de production pour la défense sur les marchés des États-Unis et des pays de l'OTAN".

En 1965-66, le programme d'aide à la recherche industrielle du Conseil national de recherches a, croit-on, coûté environ 3.4 millions de dollars. Il vise deux objectifs: d'abord, "la création de nouvelles installations et l'agrandissement des installations existantes de recherches dans les entreprises industrielles" et ensuite, "l'amélioration des communications entre les chercheurs des laboratoires gouvernementaux et ceux des laboratoires industriels".

Un programme pour l'avancement de la technologie industrielle a récemment été approuvé et, en 1965-66, première année de son existence, il a coûté près de 1 million de dollars. Administré par le ministère de l'Industrie, son but principal est "d'aider l'industrie à s'aider elle-même en améliorant sa technologie et en poussant ses inventions, et d'appuyer des projets de mise au point de véritables progrès techniques, dont la réussite offrirait de bonnes perspectives commerciales".

Il faut observer que le gouvernement et l'industrie se partagent les frais de tous ces programmes. En général, le gouvernement en paie approximativement la moitié.

L'encouragement à la recherche et au développement industriels vient aussi par l'entremise de contrats de R & D ou pour de l'outillage et des matières neuves, contrats qui exigent des industries d'effectuer d'abord une certaine somme de R & D. Ces contrats sont souvent attribués à des sociétés canadiennes afin de les encourager à perfectionner les moyens et les spécialités appropriés dont elles ont besoin pour pouvoir mettre en valeur des découvertes des laboratoires de l'État.

¹ This description of the various programmes is based on the summary contained in a 1965 report by the Advisory Committee on Industrial Research and Technology of the Economic Council of Canada, "A General Incentive Programme to Encourage Research and Development in Canada Industry," pages 7-11.

¹ La description des divers programmes se fonde sur un exposé sommaire contenu dans un rapport du Comité consultatif sur la recherche industrielle et la technologie du Conseil économique du Canada, en 1965, et intitulé "Programme général de stimulation des travaux de recherche et de développement dans l'industrie canadienne", pages 7-11.

Besides such direct assistance, the Government further encourages industrial R & D through income tax legislation. At present, corporations are allowed to deduct all current and capital expenditures for R & D from taxable income; in addition, 50 per cent of these expenditures in Canada which exceed those of the base period (1961) may also be deducted. This programme is expected to be modified during the current year. The estimated forgone tax revenues were almost \$13 million in 1964 (these "costs" are not collected in the survey).

En dehors d'une telle aide directe, le gouvernement encourage aussi la recherche et le développement industriels au moyen de législation fiscale. Actuellement, il est permis aux sociétés de déduire de leur revenu imposable toutes leurs dépenses courantes et d'investissement pour la R & D; en outre, 50 p. 100 des dépenses qui, au Canada, dépassent les débours totaux de l'année de base (1961) peuvent aussi être déduits. On s'attend que le programme soit modifié durant l'année actuelle. Le gouvernement fédéral a ainsi renoncé à près de 13 millions de dollars d'impôt sur le revenu en 1964 (ces "frais" ne sont pas relevés à l'enquête).

Industrial R & D Contracts and Grants
Contrats et subventions de R & D industriels

Department or agency — Ministère ou organisme	1956-57 ¹	1957-58 ¹	1958-59 ¹	1959-60 ¹	1960-61	1961-62	1962-63	1963-64 ²	1964-65 ²	1965-66 ³
	millions of dollars — millions de dollars									
AECL ⁴	—	—	—	3.1	3.7	5.6	4.5	4.0	4.7	5.3
Industry ⁵ — Industrie ⁵	—	—	—	1.9	2.9	5.5	8.0	19.0	20.1	24.7
NRC ⁶ — C.N.R. ⁶	—	—	—	—	0.1	0.2	0.5	1.5	2.2	3.4
Other ⁷ — Autre ⁷	0.6	0.2	0.1	0.9	0.8	0.3	0.2	0.2	0.8	1.9
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	43.1	51.1	45.2	8.6	8.6	7.4	4.4	6.4	10.4	26.0
DRB ⁸ — C.R.D. ⁸	1.5	1.9	2.2	1.3	1.6	2.0	2.6	4.8	6.8	8.4
Total⁹	45.2	53.1	47.6	15.7	17.6	21.0	20.2	35.9	45.0	69.7

¹ Obtained from "Scientific Research and Development", Report No. 23 of the Royal Commission on Government Organization, Ottawa, the Queen's Printer, 1963, Appendix 9.

² Revised.

³ Estimated.

⁴ Atomic Energy of Canada Limited.

⁵ Formerly Department of Defence Production.

⁶ National Research Council.

⁷ Includes Central Mortgage and Housing Corporation, the Post Office and the Departments of Forestry, Transport, and Mines and Technical Surveys.

⁸ Defence Research Board.

⁹ Totals may not add exactly due to rounding.

¹ Tiré de "La recherche scientifique et ses applications," rapport no 23 de la Commission royale d'enquête sur l'Organisation du gouvernement, Ottawa, Imprimeur de la Reine, 1963, appendice 9.

² Révisé.

³ Évalué.

⁴ Atomic Energy of Canada Limited.

⁵ Autrefois ministère de la Production de défense.

⁶ Conseil national de recherches.

⁷ Comprend la Société centrale d'hypothèques et de logement et les ministères des Postes, des Forêts, des Transports, et des Mines et des Relevés techniques.

⁸ Conseil de recherches pour la défense.

⁹ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Probable Field of Application of Industrial Contracts and Grants
Domaine probable d'attribution de contrats et de subventions industriels

Field of application — Domaine d'attribution	1962-63	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Nuclear energy — Énergie nucléaire	4.5	4.0	4.7	5.3
Space — Espace	0.8	0.9	1.8	2.2
War and defence — Guerre et défense	14.2	29.3	35.5	55.1
Other — Autre	0.7	1.7	3.0	7.0
Total³	20.2	35.9	45.0	69.7

¹ Revised.

² Estimated.

³ Totals may not add exactly due to rounding.

¹ Révisé.

² Évalué.

³ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

During the last four years, the amount of Federal funds disbursed in the form of research grants and contracts to Canadian universities and colleges has more than doubled. In 1965-66 such assistance amounted to almost \$40 million. Two agencies, the National Research Council and the Medical Research Council, distribute about three-quarters of all funds for direct assistance of university and college research. The NRC supports research projects in all fields of science, whereas the MRC is involved only in the medical sciences. Slightly over a third of total Government R & D payments to educational institutions are for research in the medical sciences. These funds come largely from the MRC and the Department of National Health and Welfare.

Durant les quatre dernières années, les débours fédéraux sous forme de subventions et contrats de recherche aux universités et collèges canadiens ont plus que doublé. En 1965-66, cette aide s'est élevée à près de 40 millions de dollars. Deux organismes, le Conseil national de recherches et le Conseil de recherches médicales, distribuent les trois quarts environ de tous les fonds d'aide directs à la recherche dans les universités et les collèges. Le C.N.R. appuie les projets de recherche dans tous les domaines de la science tandis que le C.R.M. se limite aux sciences médicales. Un peu plus du tiers de tous les versements de R & D du gouvernement aux établissements d'enseignement est destiné aux recherches dans le domaine médical. Ces fonds proviennent en majeure partie du C.R.M. et du ministère de la Santé nationale et du Bien-être social.

Federal Government Contracts and Grants for Research in Canadian Educational Institutions
Contrats et subventions de recherche du gouvernement fédéral aux établissements d'enseignement canadiens

Department or agency — Ministère ou organisme	1956-57 ¹	1957-58 ¹	1958-59 ¹	1959-60 ¹	1960-61	1961-62	1962-63 ²	1963-64 ²	1964-65 ²	1965-66 ³
	millions of dollars — millions de dollars									
AECB ⁴ — C.C.E.A. ⁴	0.3	0.4	0.4	0.7	0.7	0.7	0.8	0.9	1.3	1.6
MRC ⁵ — C.R.M. ⁵	—	—	—	—	—	6	3.5 ⁷	4.2 ⁷	5.3	10.0
NHW ⁸ — S.N.B.S. ⁸	1.2 ⁹	1.3 ⁹	1.4 ⁹	1.8 ⁹	2.1	2.1	2.2	2.1	2.3	2.4
NRC — C.N.R.	3.4	3.5	6.0	8.3	9.4	11.1	8.3 ⁷	10.3 ⁷	14.5	18.5
Other ¹⁰ — Autre ¹⁰	0.1	0.1	0.1	0.1	0.4	0.6	0.5	0.5	1.1	3.0
DRB — C.R.D.	1.3	1.4	1.4	1.5	1.7	1.7	1.9	1.9	2.3	2.3
Total¹¹	6.3	6.7	9.3	12.3	14.2	16.2	17.3	20.0	26.8	37.9

¹ Obtained from "Scientific Research and Development", Report No. 23 of the Royal Commission on Government Organization, Ottawa, the Queen's Printer, 1963, Appendix 10.

² Revised.

³ Estimated.

⁴ Atomic Energy Control Board.

⁵ Medical Research Council.

⁶ Included in NRC estimates. Probably between \$2.7 and \$3.0 million.

⁷ Revised. Funds for associateships, senior and post doctorate fellowships intended for research are now included.

⁸ Department of National Health and Welfare.

⁹ Revised. Previously published figures included payments to non-educational institutions. Estimates of grants to colleges and universities only are based on the proportions found in later years when such details were available.

¹⁰ Atomic Energy of Canada Limited, Central Mortgage and Housing Corporation and the Departments of Agriculture, Fisheries, Forestry, Industry, Mines and Technical Surveys, Northern Affairs and National Resources, and Transport.

¹¹ Totals may not add exactly due to rounding.

¹ Tiré de "La recherche scientifique et ses applications", rapport no 23 de la Commission royale d'enquête sur l'Organisation du gouvernement, Ottawa, Imprimeur de la Reine, 1963, appendice 10.

² Révisé.

³ Évalué.

⁴ Commission de contrôle de l'énergie atomique.

⁵ Conseil de recherches médicales.

⁶ Compris dans les estimations du C.N.R. Probablement entre \$2,700,000 et \$3,000,000.

⁷ Révisé. Les fonds destinés aux bourses universitaires et post-doctorales pour la recherche sont maintenant inclus.

⁸ Ministère de la Santé nationale et du Bien-être social.

⁹ Révisé. Les chiffres publiés antérieurement comprenaient les paiements aux établissements non éducationnels. Les estimations des subventions aux collèges et aux universités seulement sont fondées sur les proportions observées les années les plus récentes où ces détails étaient disponibles.

¹⁰ Atomic Energy of Canada Limited, la Société centrale d'hypothèques et de logement et les ministères de l'Agriculture, des Pêcheries, des Forêts, de l'Industrie, des Mines et des Relevés techniques, du Nord canadien et des Ressources nationales, et des Transports.

¹¹ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Probable Field of Science of Government-Sponsored R & D
Domaine scientifique probable de la R & D commandité par le gouvernement

Field of science — Domaine scientifique	1962-63 ¹	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Engineering — Génie	1.6	2.2	3.4	5.4
Chemistry — Chimie	2.5	3.0	3.8	4.7
Earth sciences — Sciences géologiques	1.2	1.3	1.8	2.3
Physics — Physique	2.4	2.7	4.1	5.5
Biological sciences — Sciences biologiques	2.5	3.0	4.0	5.1
Medical sciences — Sciences médicales	6.4	7.1	8.7	13.6
Other — Autre	0.7	0.7	1.1	1.3
Total³	17.3	20.0	26.8	37.9

¹ Revised.

² Estimated.

³ Totals may not add exactly due to rounding.

¹ Révisé.

² Évalué.

³ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Field of Science and Type of R & D

About two-thirds of the Federal Government's intra-mural expenditures on R & D are for projects in the physical sciences. Research and development in the field of engineering account for approximately half of the expenditures in the physical sciences. Of the life sciences, the agricultural sciences receive about 60 per cent of the funds available.

The Department of National Defence, Atomic Energy of Canada Limited and the National Research Council account for the bulk of the R & D in the physical sciences. Over half of these expenditures by the DND and AECL are for engineering R & D. In the life sciences, most of the work is carried out by the Departments of Agriculture, Fisheries and Forestry.

Although estimates of type of R & D should be used with caution because of conceptual and survey difficulties, it seems that the Federal Government is mainly involved in applied research. Basic research and development may each account for 15-20 per cent of total current intra-mural expenditures. The NRC and AECL report the largest expenditures for basic research and the Departments of National Defence and Agriculture for applied research. The Department of National Defence spends over 40 per cent of the total funds used for development.

Domaine scientifique et type de R & D

Les deux tiers environ des dépenses fédérales en R & D *intra-muros* vont à des projets du domaine des sciences physiques. La recherche et le développement dans celui du génie absorbe à peu près la moitié des dépenses qui vont aux sciences physiques. Dans les sciences de la vie les sciences agricoles retiennent environ 60 p. 100 des fonds disponibles.

Le ministère de la Défense nationale, l'*Atomic Energy of Canada Limited* et le Conseil national de recherches sont comptables du gros de la R & D dans le domaine des sciences physiques. Plus de la moitié des dépenses du M.D.N. et de l'*AECL* va à la R & D en génie. Dans les sciences de la vie, la majeure partie du travail est exécutée par les ministères de l'Agriculture, des Pêcheries et des Forêts.

Bien qu'il faille accueillir avec réserve les données quant aux types de R & D en raison des difficultés que présentent les concepts et les enquêtes, il semble que le gouvernement fédéral soit surtout intéressé aux recherches appliquées. La recherche fondamentale et le développement absorbent peut-être chacun de 15 à 20 p. 100 de toutes les dépenses *intra-muros*. Le C.N.R. et l'*AECL* sont responsables pour le gros des dépenses en recherches fondamentales et les ministères de la Défense nationale et de l'Agriculture, en recherches appliquées. Le ministère de la Défense nationale dépense plus de 40 p. 100 de toutes les sommes affectées au développement.

Current Intra-mural R & D Expenditures¹

Dépenses courantes de R & D *intra-muros*¹

Field of science — Domaine scientifique	Type of R & D — Type de R & D							
	1964 - 65 ²				1965 - 66 ³			
	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement	Total ⁴	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement	Total ⁴
millions of dollars — millions de dollars								
Physical sciences — Sciences physiques:								
Engineering — Génie	1.5	37.4	20.0	59.0	1.7	40.3	19.8	61.8
Other — Autre	20.5	32.3	2.3	55.1	27.1	34.1	2.7	63.8
Sub-totals ⁴ — Totaux partiels ⁴ ...	22.0	69.7	22.3	114.1	28.8	74.4	22.5	125.6
Life Sciences — Sciences de la vie:								
Agricultural — Sciences agricoles	3.0	24.8	3.2	31.1	3.2	26.9	3.5	33.6
Biological — Sciences biologiques	3.6	10.0	1.6	15.2	4.1	11.5	1.8	17.5
Medical — Sciences médicales.....	0.3	3.9	0.4	4.6	0.3	4.1	0.5	4.8
Sub-totals ⁴ — Totaux partiels ⁴ ...	6.9	38.7	5.3	50.8	7.6	42.5	5.8	55.9
Total ⁴	29.0	108.4	27.6	164.9	36.4	116.8	28.3	181.5

¹ Excluding the costs of administering grants and contracts.

² Revised.

³ Estimated.

⁴ Totals and sub-totals may not add exactly due to rounding.

¹ Sans les frais d'administration des subventions et des contrats.

² Révisé.

³ Évalué.

⁴ Les totaux et les totaux partiels ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Areas of Investigation

About one-third of government sponsored R & D is directed toward military uses. Most of the funds for military R & D are administered by the Departments of Industry and National Defence.

Scientific research and development for use in the fields of agriculture, fishing and forestry account for approximately one-fifth of the Government's total current expenditures on R & D. Research and development in nuclear science are responsible for another sixth of the total.

Domaines d'investigation

Un tiers environ de la R & D commandité par le gouvernement est consacré à des usages militaires. La majeure partie des sommes affectées à la R & D militaire est administrée par les ministères de l'Industrie et de la Défense nationale.

La recherche et le développement scientifiques dans les domaines de l'agriculture, de la pêche et des forêts prennent approximativement un cinquième des dépenses courantes totales de gouvernement pour la R & D. La recherche et le développement en science nucléaire en absorbe un sixième.

General Areas of Investigation Domaines généraux d'investigation

Area of investigation Domaine d'investigation	Current R & D expenditures Dépenses courantes de R & D			
	1962-63 ¹	1963-64 ¹	1964-65 ¹	1965-66 ²
	millions of dollars — millions de dollars			
Nuclear science — Sciences nucléaires	31.5	34.9	39.3	44.9
Space travel and communications — Voyages et communications spatiales	1.6	2.4	4.7	9.4
Military science — Sciences militaires	61.8	80.5	81.0	100.3
Agriculture, fishing and forestry — Agriculture, pêche et foresterie	44.7	46.8	50.2	57.9
Health and hygiene — Santé et hygiène	11.2	13.2	15.3	21.0
Industry — Industrie	12.9	13.4	14.5	18.8
Other — Autres	28.0	31.0	35.7	41.7
Total	191.7	222.2	240.7	294.0

¹ Revised.
² Estimated.

¹ Révisé.
² Évalué.

NOTES ON THE SURVEY

1. Total Expenditures

Since scientific activities cut across the classifications used in government records (i.e. "standard objects" such as civil salaries and wages, postage, materials and supplies, etc.), it is generally difficult for the respondents to make accurate estimates. Organizations which are entirely engaged in scientific activities, or which have a division performing all their scientific work, can calculate their scientific costs more readily than others which do not have a clear distinction between their scientific and non-scientific activities. Another general problem is the allocation of "overhead" costs. For example, the Departments of Public Works and Finance, among others, provide services to other departments. Departments or agencies do not require the same degree of support, and, of course, the services provided any organization would normally vary from time to time. Estimates are provided of the more common forms of inter-departmental support, but only at department or agency level. There remains the problem of allocating the correct proportions to scientific activities.

2. Classes of Scientific Activities

It is often difficult to distinguish between certain of the classifications used in these surveys. Research and development, scientific data collection and scientific information are often performed together and by the same people. A given project, if part of a larger research programme, would be classed as R & D; the same project, when outside of a research programme, may be another scientific activity. The officials who can provide the financial data required are not always able to classify the scientific activity.

3. Current and Capital Expenditures

The distinction between current and capital expenditures is sometimes hard to maintain. Much of the equipment used in research is extremely specialized and may have a very short life, large research units may also build some of their own equipment from materials on hand and perhaps with parts from discarded equipment. This has led to the concept of "expendable research equipment" which is used by some departments. To ensure that inter-departmental figures are comparable, adjustments are occasionally required to the capital expenditures reported by other departments. The inclusion of expendable research equipment in current expenditures may lead to fluctuations in costs not connected with variations in the amount of work performed. The allocation of expenditures on multi-purpose plant presents problems similar to those discussed in Section 1.

NOTES RELATIVES À L'ENQUÊTE

1. Dépenses totales

Étant donné que les classements employés dans les dossiers du gouvernement (i.e. "objets ordinaires" comme traitements et salaires civils, postes, matériel et fournitures, etc.) ne font pas ressortir l'activité scientifique, il est en général difficile aux répondants de donner des estimations exactes. Les organismes qui se consacrent entièrement à l'activité scientifique ou qui disposent d'une division chargée de tout le travail scientifique peuvent calculer leurs frais scientifiques plus facilement que d'autres qui ne font pas de distinction nette entre leurs initiatives scientifiques et non scientifiques. La répartition des "frais généraux" est un autre problème commun. Par exemple, les ministères des Travaux publics et des Finances, entre autres, rendent des services à d'autres ministères. Ministères et organismes n'exigent pas ces services dans la même mesure et, il va sans dire, les services fournis à un organisme quelconque peuvent, normalement, varier de temps à autre. Les estimations sont fournies quant aux formes ordinaires de service interministériel mais à l'échelon du ministère ou de l'organisme seulement. Il reste le problème de les répartir en proportions exactes à l'activité scientifique.

2. Classes d'activités scientifiques

Il est souvent difficile de distinguer entre certaines des classes employées dans ces enquêtes. La recherche et le développement, la collecte des données scientifiques et l'information scientifique se font souvent en même temps et par les mêmes personnes. S'il fait partie d'un grand programme de recherche, un projet donné serait classé R & D; le même projet, en dehors d'un programme de recherche serait une autre activité scientifique. Les fonctionnaires qui peuvent fournir les données financières requises ne peuvent pas toujours classer l'activité scientifique.

3. Dépenses courantes et dépenses d'investissement

La distinction entre les dépenses courantes et les dépenses d'investissement est parfois difficile à établir. Une bonne partie de l'équipement employé dans la recherche est extrêmement spécialisé et peut n'avoir qu'une très courte durée, les grands services de recherche peuvent aussi fabriquer une partie de leur équipement avec des matériaux dont ils disposent et peut-être des pièces tirées d'un équipement mis au rancart. Cela amène le concept de "l'équipement de recherche consommable" dont se servent certains ministères. Pour que les chiffres interministériels soient comparables, il faut, à l'occasion, ajuster les chiffres des investissements déclarés par d'autres ministères. L'inclusion de l'équipement de recherche consommable dans les dépenses courantes peut entraîner des fluctuations de coûts étrangères aux variations de la somme du travail exécuté. La répartition des dépenses en

Another problem is that the Canadian Forces are not able to provide data on many of their capital projects.

4. Fields of Research and Development

It is extremely difficult to consistently distinguish between the scientific fields, since a project generally will require work in a number of fields. Furthermore, in a number of cases there is no longer a clear distinction between these fields, for example, "new" areas such as biochemistry, bio-physics and engineering physics are becoming more common. Many projects may also be classified in several ways, for example, a study of a medical problem requiring biological research could be considered as either medical or biological. The individual scientist may be able to classify his work by scientific field, but the person completing the questionnaire, who is generally an administrator, will often have to rely mainly on financial and other files which are readily available. Probably the most common way of allocating expenditures among the fields of science is on the basis of personnel, i.e. assuming that physicists are working only in physics, hence the amount of money spent in that field of research corresponds to the proportion of physicists among R & D personnel.

The exclusion of the social and psychological sciences from the survey has caused additional problems for a number of respondents. This is especially true for those involved in medical research. Research projects requiring anthropological as well as wildlife and botanical studies are also affected by this exclusion.

5. Types of Research and Development

The further classification of R & D expenditures into basic research, applied research and development was attempted for the first time in the preceding survey. There are a number of problems associated with such a classification. One problem is caused by the variety of definitions which people normally use — definitions which they may continue to use, perhaps only subconsciously, when completing a questionnaire. Even supposing that it were possible to clearly distinguish between the types of research or development, it should be realized that the progress of one project may take it through all three types at least once. A programme of R & D could contain a number of such projects, thus making the analysis quite complicated. Distinguishing between "oriented" basic research and applied research is especially difficult.

installations à fins multiples présente des problèmes analogues à ceux qui sont étudiés dans la Section 1. Un autre problème tient à ce que les Forces armées ne peuvent pas fournir de données quant à plusieurs de leurs projets d'investissement.

4. Domaines de la recherche et du développement

Il est extrêmement difficile de toujours distinguer entre les domaines scientifiques étant donné qu'en général un projet exigera des travaux dans un certain nombre de domaines. De surcroît, dans un certain nombre de cas, il n'existe plus de distinction nette entre ces domaines; par exemple, les "nouveaux" domaines tels que la biochimie, la biophysique et la physique appliquée, deviennent plus communs. On peut classer aussi plusieurs projets de diverses façons, par exemple, une étude d'un problème médical qui exige des recherches biologiques pourrait être considérée comme projet de recherches médicales ou projet de recherches biologiques. L'investigateur individuel pourra peut-être classer son travail suivant le domaine scientifique mais la personne qui répond au questionnaire, généralement un administrateur, devra souvent s'en remettre surtout à des dossiers financiers et autres, d'accès facile. La façon la plus commune probablement de répartir les dépenses entre les domaines de la science se base sur le personnel, i.e. en supposant que les physiciens ne travaillent que dans la physique et que, conséquemment, la somme d'argent dépensée dans ce domaine de recherche correspond à la proportion de physiciens parmi les effectifs de R & D.

L'exclusion des sciences sociales et psychologiques de l'enquête a causé des problèmes supplémentaires à un certain nombre de répondants. Il en est particulièrement ainsi de ceux qui sont engagés dans la recherche médicale. Les projets de recherche qui demandent des études anthropologiques aussi bien que fauniques et botaniques sont aussi touchés par cette exclusion.

5. Types de recherche et de développement

On a tenté pour la première fois dans l'enquête précédente de pousser plus loin le classement des dépenses de R & D entre recherche fondamentale, recherche appliquée et développement. Il y a un certain nombre de problèmes qui s'associent à un tel classement, dont l'un tient à la variété des définitions normalement employées, définitions que l'on continuera peut-être à employer, inconsciemment, en répondant au questionnaire. Même en supposant qu'il soit possible de distinguer nettement entre les types de recherche et de développement, il faut bien se rendre compte que l'avancement d'un projet peut passer par les trois formes au moins une fois. Un programme de R & D peut contenir un certain nombre de ces projets, ce qui ne peut que compliquer gravement l'étude. Il est particulièrement difficile de distinguer entre la recherche fondamentale "orientée" et la recherche appliquée.

6. Personnel Engaged in R & D

For departments or agencies with distinct R & D units, the calculation of total R & D personnel should be relatively straightforward. In other cases the calculation may be quite difficult, since the persons must first be identified as employed in research and development, and then the proportion of time spent on R & D must be determined. Estimates of the number of persons involved in administrative support of R & D are not yet satisfactory.

7. Continuity

The historical comparability of the data for individual departments and agencies suffers from a lack of continuity in response. This is due primarily to the two year interval between surveys. Not only may previous respondents fail to apply the same principles and concepts consistently, but many of the respondents will change during these two years. These new respondents will often have different interpretations of both their unit's work and of the survey definitions.

6. Effectif de R & D

Dans le cas des ministères ou organismes disposant de services distincts de R & D, le calcul du personnel total de R & D devrait être assez facile. En d'autres cas, il peut être plutôt difficile, étant donné qu'il faut d'abord identifier les personnes à la recherche et au développement et, ensuite, déterminer la proportion de temps consacrée à la R & D. Les estimations du nombre de personnes engagées dans les services administratifs auxiliaires de R & D ne sont pas encore satisfaisantes.

7. Continuité

Une comparabilité chronologique des données relatives à chaque ministère et organisme souffre du manque de continuité dans la réponse qui tient principalement à l'intervalle de deux ans entre les enquêtes. Non seulement les répondants antérieurs peuvent ne pas suivre toujours les mêmes principes et concepts mais plusieurs des répondants peuvent changer au cours des deux années. Les nouveaux répondants interpréteront souvent de façon différente le travail de l'unité et les définitions de l'enquête.

STATISTICAL TABLES

TABLEAUX STATISTIQUES

TABLE 1. Federal Government Expenditures on R & D and on All Scientific Activities, by Department or Agency
TABLEAU 1. Dépenses du gouvernement fédéral en R & D et toutes activités scientifiques, par ministère ou organisme

Department or agency — Ministère ou organisme	1962-63		1963-64		1964-65 ¹		1965-66	
	R & D	Total	R & D	Total	R & D	Total	R & D	Total
thousands of dollars — milliers de dollars								
Agriculture.....	28,651	29,599	29,603	30,577	32,741	33,409	38,664	39,390
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique.....	770	770	900	900	1,250	1,250	1,600	1,600
Atomic Energy of Canada Limited.....	38,542	38,632	45,559	45,594	53,023	53,070	55,321	55,376
Canadian Arsenals Limited — Arsenaux canadiens.....	412	412	355	355	107	107	88	88
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement.....	55	55	43	43	46	46	88	88
Fisheries — Pêcheries.....	10,305	10,306	9,728	9,733	10,924	10,949	15,013	15,036
Forestry — Forêts.....	7,747	9,386	9,294	11,042	10,092	13,694	11,205	15,204
Industry — Industrie.....	8,000	8,000	19,000	19,000	20,527	20,527	26,742	26,742
Medical Research Council — Conseil de la recherche médicale.....	3,949 ²	4,368	4,697 ²	5,184	5,954	7,040	10,897	12,358
Mines and Technical Surveys — Mines et Relevés techniques:								
Dominion Observatories — Observatoires fédéraux.....	2,704	2,736	2,955	2,985	3,464	3,503	6,300	6,355
Geographical Branch — Direction de la géographie.....	660 ³	685	771 ³	798	920	931	1,070	1,082
Geological Survey of Canada — Levés géologiques.....	4,190	7,863	4,251	8,217	4,702	8,880	5,571	9,162
Marine Sciences — Sciences de la mer.....	1,525	12,658	1,010	11,215	1,716	10,530	1,984	11,596
Mines.....	5,302	6,649	5,436	6,793	5,575	6,976	6,303	7,965
Polar Continental Shelf Project — Études du plateau continental polaire.....	158	1,845	155	1,719	88	1,794	78	1,913
Surveys and Mapping — Levés et la cartographie.....	—	7,001	—	7,202	—	7,139	6	7,835
Water Resources — Ressources hydrauliques.....	611	2,963	1,007	3,359	819	3,858	1,093	5,242
Dominion Coal Board — Office fédéral du charbon.....	—	—	—	—	—	—	23	23
Sub-totals — Totaux partiels	15,150	42,400	15,585	42,288	17,284	43,611	22,428	51,173
National Health and Welfare — Santé nationale et Bien-être social.....	6,338	6,946	6,933	7,697	9,149	10,074	7,842	9,093
National Research Council — Conseil national de recherches.....	36,656 ⁴	40,363	42,987 ⁴	47,278	49,265	53,754	60,568	66,652
Northern Affairs and National Resources — Nord canadien et Ressources nationales:								
Canadian Wildlife Service — Service canadien de la faune.....	687	982	811	1,168	892	1,322	1,302	1,993
Northern Co-ordination and Research Centre — Centre de coordination et recherches sur le nord.....	60	157	70	181	120	242	175	339
Sub-totals — Totaux partiels	747	1,139	881	1,349	1,012	1,564	1,477	2,332
Post Office — Postes.....	153	156	231	234	240	244	234	238
Secretary of State — Secrétariat d'État:								
National Film Board — Office national du film.....	36	36	40	40	69	69	55	55
National Museum — Musée national du Canada.....	141	231 ⁵	119	209 ⁵	171	277	204	364
Patent and Copyright Office — Bureau de brevets et droit d'auteur.....	—	2,533	—	2,664	—	3,083	—	3,477
Sub-totals — Totaux partiels	177	2,800	159	2,913	240	3,429	259	3,896
Transport — Transports:								
Civil Aviation — Aviation civile.....	8	8	8	8	—	—	15	15
Construction.....	70	70	56	56	40	42	48	50
Marine Hydraulics — Hydraulique maritime.....	320 ⁶	320	440 ⁶	440	540	540	1,241	1,241
Meteorology — Météorologie.....	1,109	1,109	1,362	1,362	1,611	1,611	2,212	2,212
Telecommunications and Electronics — Télécommunications et l'électronique.....	273	327	1,230	1,250	6,544	6,558	7,109	7,127
Sub-totals — Totaux partiels	1,780	1,834	3,096	3,116	8,735	8,751	10,625	10,645
Veterans Affairs — Affaires des anciens combattants.....	410	410	420	420	429	429	438	438
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	159,842	197,576	189,471	227,723	221,018	261,948	263,489	310,349
National Defence — Défense nationale:								
Canadian Forces — Forces canadiennes.....	23,898 ⁷	27,562 ⁷	27,939 ⁷	31,689 ⁷	28,113	30,665	40,888	43,286
Defence Research Board — Conseil de recherches pour la défense.....	31,678	31,818	38,376	38,524	39,041	39,228	42,214	42,574
Sub-totals — Totaux partiels	55,576	59,380	66,315	70,213	67,154	69,893	83,102	85,860
All departments and agencies — Total — Tous les ministères et organismes	215,418	256,956	255,786	297,936	288,172	331,841	346,591	396,209

¹ Revision of estimates previously published.² Revised. The value of research associateships is now included in R & D.³ Revised. These expenditures formerly considered as costs of scientific data collection.⁴ Revised. The value of those fellowships specifically intended for research is now included in R & D expenditures.⁵ Revised. New basis for estimating expenditures on scientific data collection.⁶ Revised. Work formerly thought to be scientific data collection now considered R & D.⁷ Revised. Estimates for the Institute of Aviation Medicine are now included.¹ Revision des estimations déjà publiées.² Révisé. La valeur des bourses de recherche est maintenant incluse dans R & D.³ Révisé. Ces dépenses autrefois considérées comme frais de collecte des données scientifiques.⁴ Révisé. La valeur des bourses destinées spécifiquement à la recherche est maintenant incluse dans R & D.⁵ Révisé. Nouvelle base d'estimation des dépenses pour collecte des données scientifiques.⁶ Révisé. Travail jugé autrefois comme collecte des données scientifiques est jugé maintenant comme R & D.⁷ Révisé. Estimations de l'Institut de la médecine aéronautique maintenant incluses.

TABLE 2 A. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1964-65

TABLEAU 2 A. Dépenses du gouvernement fédéral en activités scientifiques, par ministère ou organisme et par activité, exercice 1964-65

Department or agency — Ministère ou organisme	Scientific R & D — R & D scientifiques					Other scientific activities — Autres activités scientifiques					Total, all sci- entific activi- ties
	Conduct of R & D	Grants in aid of R & D	Sub- total	Capital expendi- tures	Total expendi- tures on R & D	Scien- tific data collec- tion	Scien- tific informa- tion	Scholar- ships and fellow- ships	Sub- total	Capital expendi- tures	Total, all sci- entific activi- ties
	Exécu- tion de la R & D	Subven- tions d'appoint pour R & D	Total partiel	Immobili- sations	Dépenses totales en R & D	Réunion des données scienti- fiques	Informa- tion scienti- fique	Bourses d'études et universi- taires	Total partiel	Immobili- sations	Total, toutes activités scienti- fiques
thousands of dollars — milliers de dollars											
Agriculture	26,593	145	26,738	6,003	32,741	9	659	—	668	—	33,409
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	1,250	1,250	—	1,250	—	—	—	—	—	1,250
Atomic Energy of Canada Limited	35,696	—	35,696	17,327	53,023	—	—	47	47	—	53,070
Canadian Arsenals Limited — Arsenaux canadiens	107	—	107	—	107	—	—	—	—	—	107
Central Mortgage and Housing Corporation — Société cen- trale d'hypothèques et de logement	—	46	46	—	46	—	—	—	—	—	46
Fisheries — Pêcheries	9,220	57	9,277	1,647	10,924	—	—	25	25	—	10,949
Forestry — Forêts	6,993	658	7,651	2,441	10,092	3,178	424	—	3,602	—	13,694
Industry — Industrie	20,527	—	20,527	—	20,527	—	—	—	—	—	20,527
Medical Research Council — Conseil de la recherche médi- cale	—	5,954	5,954	—	5,954	—	11	1,075	1,086	—	7,040
Mines and Technical Surveys — Mines et Relevés techni- ques:											
Dominion Observatories — Observatoires fédéraux	2,615	—	2,615	849	3,464	—	39	—	39	—	3,503
Geographical Branch — Direction de la géographie	920	—	920	—	920	—	11	—	11	—	931
Geological Survey of Canada — Levés géologiques	4,238	100	4,338	364	4,702	3,629	549	—	4,178	—	8,880
Marine Sciences — Sciences de la mer	1,669	—	1,669	47	1,716	6,668	41	—	6,709	2,105	10,530
Mines	5,057	50	5,107	468	5,575	535	866	—	1,401	—	6,976
Polar Continental Shelf Project — Études du plateau continental polaire	88	—	88	—	88	1,660	5	—	1,665	41	1,794
Surveys and Mapping — Levés et la cartographie	—	—	—	—	—	4,429	2,710	—	7,139	—	7,139
Water Resources — Ressources hydrauliques	819	—	819	—	819	2,422	321	—	2,743	296	3,858
Dominion Coal Board — Office fédéral du charbon	—	—	—	—	—	—	—	—	—	—	—
Sub-totals — Totaux partiels	15,406	150	15,556	1,728	17,284	19,343	4,542	—	23,885	2,442	43,611
National Health and Welfare — Santé nationale et Bien-être social	1,922	4,605	6,527	2,622	9,149	580	92	253	925	—	10,074
National Research Council — Conseil national de recher- ches	27,179	17,256	44,435	4,830	49,265	155	2,013	2,321	4,489	—	53,754
Northern Affairs and National Resources — Nord canadien et Ressources nationales:											
Canadian Wildlife Service — Service canadien de la faune	748	—	748	144	892	366	60	4	430	—	1,322
Northern Co-ordination and Research centre — Centre de coordination et recherches sur le nord	—	120	120	—	120	101	21	—	122	—	242
Sub-totals — Totaux partiels	748	120	868	144	1,012	467	81	4	552	—	1,564
Post Office — Postes	219	—	219	21	240	—	4	—	4	—	244
Secretary of State — Secrétariat d'État:											
National Film Board — Office national du film	64	—	64	5	69	—	—	—	—	—	69
National Museum — Musée national du Canada	171	—	171	—	171	70	36	—	106	—	277
Patent and Copyright Office — Bureau de brevets et droit d'auteur	—	—	—	—	—	—	3,083	—	3,083	—	3,083
Sub-totals — Totaux partiels	235	—	235	5	240	70	3,119	—	3,189	—	3,429
Transport — Transports:											
Civil Aviation — Aviation civile	—	—	—	—	—	—	—	—	—	—	—
Construction	25	—	25	15	40	2	—	—	2	—	42
Marine Hydraulics — Hydraulique maritime	507	—	507	33	540	—	—	—	—	—	540
Meteorology — Météorologie	1,230	95	1,325	286	1,611	—	—	—	—	—	1,611
Telecommunications and Electronics — Télécommuni- cations et l'électronique	339	—	339	6,205	6,544	—	14	—	14	—	6,558
Sub-totals — Totaux partiels	2,101	95	2,196	6,539	8,735	2	14	—	16	—	8,751
Veterans Affairs — Affaires des anciens combattants	429	—	429	—	429	—	—	—	—	—	429
All departments and agencies except National De- fence — Total — Tous les ministères et organis- mes à l'exclusion de la Défense nationale.	147,375	30,336	177,711	43,307	221,018	23,804	10,959	3,725	38,488	2,442	261,948
National Defence — Défense nationale:											
Canadian Forces — Forces canadiennes	25,678	—	25,678	2,435	28,113	579	1,710	—	2,289	263	30,665
Defence Research Board — Conseil de recherches pour la défense	31,573	5,717	37,290	1,751	39,041	—	127	60	187	—	39,228
Sub-totals — Totaux partiels	57,251	5,717	62,968	4,186	67,154	579	1,837	60	2,476	263	69,893
All departments and agencies — Total — Tous les ministères et organismes	204,626	36,053	240,679	47,493	288,172	24,383	12,796	3,785	40,964	2,705	331,841

TABLE 2 B. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Activity, Fiscal Year 1965-66

TABLEAU 2 B. Dépenses du gouvernement fédéral en activités scientifiques, par ministère ou organisme et par activité, exercice 1965-66

Department or agency Ministère ou organisme	Scientific R & D — R & D scientifiques					Other scientific activities — Autres activités scientifiques					Total, all scientific activities — Total, toutes activités scientifi- ques
	Conduct of R & D	Grants in aid of R & D	Sub- total	Capital expendi- tures	Total expendi- tures on R & D	Scien- tific data collec- tion	Scien- tific informa- tion	Scholar- ships and fellow- ships	Sub- total	Capital expendi- tures	
	Exécu- tion de la R & D	Subven- tions d'appoint pour R & D	Total partiel	Immobi- liations	Dé- penses totales en R & D	Réunion des données scienti- fiques	Informa- tion scienti- fique	Bourses d'études et universi- taires	Total partiel	Immobi- liations	
thousands of dollars — milliers de dollars											
Agriculture	28,707	145	28,852	9,812	38,664	10	716	—	726	—	39,390
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	1,600	1,600	—	1,600	—	—	—	—	—	1,600
Atomic Energy of Canada Limited	41,094	—	41,094	14,227	55,321	—	—	55	55	—	55,376
Canadian Arsenals Limited — Arsenaux canadiens	88	—	88	—	88	—	—	—	—	—	88
Central Mortgage and Housing Corporation — Société cen- trale d'hypothèques et de logement	—	88	88	—	88	—	—	—	—	—	88
Fisheries — Pêcheries	11,514	83	11,597	3,416	15,013	—	—	23	23	—	15,036
Forestry — Forêts	7,766	1,707	9,473	1,732	11,205	3,529	470	—	3,999	—	15,204
Industry — Industrie	26,742	—	26,742	—	26,742	—	—	—	—	—	26,742
Medical Research Council — Conseil de la recherche médicale	—	10,897	10,897	—	10,897	—	16	1,445	1,461	—	12,358
Mines and Technical Surveys — Mines et Relevés techni- ques:											
Dominion Observatories — Observatoires fédéraux	3,140	10	3,150	3,150	6,300	—	55	—	55	—	6,355
Geographical Branch — Direction de la géographie	1,069	1	1,070	—	1,070	—	12	—	12	—	1,082
Geological Survey of Canada — Levés géologiques	4,667	150	4,817	754	5,571	2,999	592	—	3,591	—	9,162
Marine Sciences — Sciences de la mer	1,761	40	1,801	183	1,984	6,050	81	—	6,131	3,481	11,596
Mines	5,438	100	5,538	765	6,303	673	989	—	1,662	—	7,965
Polar Continental Shelf Project — Études du plateau continental polaire	78	—	78	—	78	1,775	5	—	1,780	55	1,913
Surveys and Mapping — Levés et la cartographie	—	6	6	—	6	4,730	3,099	—	7,829	—	7,835
Water Resources — Ressources hydrauliques	1,093	—	1,093	—	1,093	3,232	428	—	3,660	489	5,242
Dominion Coal Board — Office fédéral du charbon	5	18	23	—	23	—	—	—	—	—	23
Sub-totals — Totaux partiels	17,251	325	17,576	4,852	22,428	19,459	5,261	—	24,720	4,025	51,173
National Health and Welfare — Santé nationale et Bien- être social	2,041	4,700	6,741	1,101	7,842	735	92	424	1,251	—	9,093
National Research Council — Conseil national de recher- ches	31,914	22,454	54,368	6,200	60,568	205	2,514	3,365	6,084	—	66,652
Northern Affairs and National Resources — Nord canadien et Ressources nationales:											
Canadian Wildlife Service — Service canadien de la faune	979	—	979	323	1,302	625	60	6	691	—	1,993
Northern Co-ordination and Research centre — Centre de coordination et recherches sur le nord	—	175	175	—	175	128	36	—	164	—	339
Sub-totals — Totaux partiels	979	175	1,154	323	1,477	753	96	6	855	—	2,332
Post Office — Postes	230	—	230	4	234	—	4	—	4	—	238
Secretary of State — Secrétariat d'État:											
National Film Board — Office national du film	50	—	50	5	55	—	—	—	—	—	55
National Museum — Musée national du Canada	204	—	204	—	204	74	86	—	160	—	364
Patent and Copyright Office — Bureau de brevets et droit d'auteur	—	—	—	—	—	—	3,477	—	3,477	—	3,477
Sub-totals — Totaux partiels	254	—	254	5	259	74	3,563	—	3,637	—	3,896
Transport — Transports:											
Civil Aviation — Aviation civile	—	15	15	—	15	—	—	—	—	—	15
Construction	30	—	30	18	48	2	—	—	2	—	50
Marine Hydraulics — Hydraulique maritime	616	—	616	625	1,241	—	—	—	—	—	1,241
Meteorology — Météorologie	1,548	110	1,658	554	2,212	—	—	—	—	—	2,212
Telecommunications and Electronics — Télécommuni- cations et l'électronique	336	—	336	6,773	7,109	18	—	—	18	—	7,127
Sub-totals — Totaux partiels	2,530	125	2,655	7,970	10,625	20	—	—	20	—	10,645
Veterans Affairs — Affaires des anciens combattants	438	—	438	—	438	—	—	—	—	—	438
All departments and agencies except National De- fence — Total — Tous les ministères et organis- mes à l'exclusion de la Défense nationale	171,548	42,299	213,847	49,642	263,489	24,785	12,732	5,318	42,835	4,025	310,349
National Defence — Défense nationale:											
Canadian Forces — Forces canadiennes	39,997	—	39,997	891	40,888	507	1,625	—	2,132	266	43,286
Defence Research Board — Conseil de recherches pour la défense	32,965	7,240	40,205	2,009	42,214	—	144	216	360	—	42,574
Sub-totals — Totaux partiels	72,962	7,240	80,202	2,900	83,102	507	1,769	216	2,492	266	85,860
All departments and agencies — Total — Tous les ministères et organismes	244,510	49,539	294,049	52,542	346,591	25,292	14,501	5,534	45,327	4,291	396,209

TABLE 3. Federal Government Expenditures on Scientific Activities, by Department or Agency and by Performing Organization

TABLEAU 3. Dépenses du gouvernement fédéral en activités scientifiques, par ministère ou organisme et par exécutant

Department or agency — Ministère ou organisme	1964-65					1965-66				
	Federal Government — Gouvernement fédéral	Canadian Industry — Indus- trie Cana- dienne	Canadian educa- tional insti- tutions — Établis- sements d'en- seigne- ment canadiens	Other — Autres	Total expendi- tures — Dépenses totales	Federal Government — Gouvernement fédéral	Canadian Industry — Indus- trie cana- dienne	Canadian educa- tional insti- tutions — Établis- sements d'en- seigne- ment canadiens	Others — Autres	Total expendi- tures — Dépenses totales
thousands of dollars — milliers de dollars										
Agriculture	33,264	—	137	8	33,409	39,245	—	138	7	39,390
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	1,250	—	1,250	—	—	1,600	—	1,600
Atomic Energy of Canada Limited	48,159	4,732	179	—	53,070	49,833	5,339	204	—	55,376
Canadian Arsenals Limited — Arsenaux canadiens	107	—	—	—	107	88	—	—	—	88
Central Mortgage and Housing Corporation — Société cen- trale d'hypothèques et de logement	15	10	4	17	46	29	6	7	46	88
Fisheries — Pêcheries	10,683	10	82	174	10,949	14,330	—	106	600	15,036
Forestry — Forêts	13,036	600	54	4	13,694	13,497	1,640	59	8	15,204
Industry — Industrie	—	20,094	400	33	20,527	—	24,730	2,000	12	26,742
Medical Research Council — Conseil de la recherche médi- cale	94	—	6,180	766	7,040	108	—	11,230	1,020	12,358
Mines and Technical Surveys — Mines et Relevés techni- ques:										
Dominion Observatories — Observatoires fédéraux	3,499	—	—	4	3,503	6,341	—	10	4	6,355
Geographical Branch — Direction de la géographie	931	—	—	—	931	1,081	—	1	—	1,082
Geological Survey of Canada — Levés géologiques	6,741	2,039	100	—	8,880	7,945	1,067	150	—	9,162
Marine Sciences — Sciences de la mer	10,530	—	—	—	10,530	11,556	—	40	—	11,596
Mines	6,926	—	50	—	6,976	7,865	—	100	—	7,965
Polar Continental Shelf Project — Études du plateau con- tinental polaire	1,768	26	—	—	1,794	1,900	—	—	13	1,913
Surveys and Mapping — Levés et la cartographie	7,139	—	—	—	7,139	7,829	—	6	—	7,835
Water Resources — Ressources hydrauliques	3,858	—	—	—	3,858	5,242	—	—	—	5,242
Dominion Coal Board — Office fédéral du charbon	—	—	—	—	—	—	—	—	23	23
Sub-totals — Totaux partiels	41,392	2,065	150	4	43,611	49,759	1,067	307	40	51,173
National Health and Welfare — Santé nationale et Bien-être social	5,328	—	2,590	2,156	10,074	4,093	—	2,818	2,182	9,093
National Research Council — Conseil national de recher- ches	33,944	2,329	16,325	1,156	53,754	40,373	3,605	21,191	1,483	66,652
Northern Affairs and National Resources — Nord canadien et Ressources nationales:										
Canadian Wildlife Service — Service canadien de la faune	1,318	—	4	—	1,322	1,987	—	6	—	1,993
Northern Co-Ordination and Research Centre — Centre de coordination et recherches sur le nord	122	—	82	38	242	164	—	111	64	339
Sub-totals — Totaux partiels	1,440	—	86	38	1,564	2,151	—	117	64	2,332
Post Office — Postes	179	18	—	47	244	198	19	—	21	238
Secretary of State — Secrétariat d'État:										
National Film Board — Office national du film	69	—	—	—	69	55	—	—	—	55
National Museum — Musée national du Canada	238	—	—	39	277	300	—	—	64	364
Patent and Copyright Office — Bureau de brevets et droit d'auteur	3,083	—	—	—	3,083	3,477	—	—	—	3,477
Sub-totals — Totaux partiels	3,390	—	—	39	3,429	3,832	—	—	64	3,896
Transport — Transports:										
Civil Aviation — Aviation civile	—	—	—	—	—	—	—	15	—	15
Construction	42	—	—	—	42	50	—	—	—	50
Marine Hydraulics — Hydraulique maritime	483	57	—	—	540	1,035	206	—	—	1,241
Meteorology — Météorologie	1,475	—	131	5	1,611	2,046	—	155	11	2,212
Telecommunications and Electronics — Télécommunica- tions et l'électronique	6,470	88	—	—	6,558	7,086	41	—	—	7,127
Sub-totals — Totaux partiels	8,470	145	131	5	8,751	10,217	247	170	11	10,645
Veteran Affairs — Affaires des anciens combattants	429	—	—	—	429	438	—	—	—	438
All departments and agencies except National De- fence — Total — Tous les ministères et organis- mes à l'exclusion de la Défense nationale	199,930	30,003	27,568	4,447	261,948	228,191	36,653	39,947	5,558	310,349
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	20,275	10,390	—	—	30,665	17,309	25,977	—	—	43,286
Defence Research Board — Conseil de recherches pour la défense	30,062	6,769	2,350	47	39,228	31,585	8,373	2,557	59	42,574
Sub-totals — Totaux partiels	50,337	17,159	2,350	47	69,893	48,894	34,350	2,557	59	85,860
All departments and agencies — Total — Tous les ministères et organismes	250,267	47,162	29,918	4,494	331,841	277,085	71,003	42,504	5,617	396,209

TABLE 4. Federal Government Total Current Expenditures on R & D, by Department or Agency and by Performing Organization

TABLEAU 4. Dépenses courantes totales du gouvernement fédéral en R & D, par ministère ou organisme et par exécutant

Department or agency Ministère ou organisme	1964-65					1965-66				
	Federal Government Gouvernement fédéral	Canadian industry Industrie canadienne	Canadian educational institutions Établissements d'enseignement canadiens	Other Autres	Total expenditures Dépenses totales	Federal Government Gouvernement fédéral	Canadian industry Industrie canadienne	Canadian educational institutions Établissements d'enseignement canadiens	Other Autres	Total expenditures Dépenses totales
thousands of dollars — milliers de dollars										
Agriculture	26,593	—	137	8	26,738	28,707	—	138	7	28,852
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	1,250	—	1,250	—	—	1,600	—	1,600
Atomic Energy of Canada Limited.....	30,832	4,732	132	—	35,696	35,606	5,339	149	—	41,094
Fisheries — Pêcheries	9,036	10	57	174	9,277	10,914	—	83	600	11,597
Forestry — Forêts	6,993	600	54	4	7,651	7,766	1,640	59	8	9,473
Industry — Industrie.....	—	20,094	400	33	20,527	—	24,730	2,000	12	26,742
Medical Research Council — Conseil de la recherche médicale	47	—	5,299	608	5,954	54	—	10,035	808	10,897
Mines and Technical Surveys — Mines et Relevés techniques:										
Dominion Observatories — Observatoires fédéraux.....	2,615	—	—	—	2,615	3,140	—	10	—	3,150
Geographical Branch — Direction de la géographie.....	920	—	—	—	920	1,069	—	1	—	1,070
Geological Survey of Canada — Levés géologiques.....	4,238	—	100	—	4,338	4,667	—	150	—	4,817
Marine Sciences — Sciences de la mer	1,669	—	—	—	1,669	1,761	—	40	—	1,801
Mines	5,057	—	50	—	5,107	5,438	—	100	—	5,538
Polar Continental Shelf Project — Études du plateau continental polaire	62	26	—	—	88	65	—	—	13	78
Surveys and Mapping — Levés et la cartographie	819	—	—	—	819	1,093	—	6	—	1,099
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	—	—
Dominion Coal Board — Office fédéral du charbon	—	—	—	—	—	5	—	—	18	23
Sub-totals — Totaux partiels	15,380	26	150	—	15,556	17,238	—	307	31	17,576
National Health and Welfare — Santé nationale et Bien-être social	2,034	—	2,337	2,156	6,527	2,165	—	2,394	2,182	6,741
National Research Council — Conseil national de recherches	27,300	2,174	14,504	457	44,435	31,906	3,400	18,540	522	54,368
Northern Affairs and National Resources — Nord canadien et Ressources nationales.....	748	—	82	38	868	979	—	111	64	1,154
Secretary of State — Secrétariat d'État	196	—	—	39	235	190	—	—	64	254
Transport — Transports:										
Civil Aviation — Aviation civile.....	—	—	—	—	—	—	—	15	—	15
Construction	25	—	—	—	25	30	—	—	—	30
Marine Hydraulics — Hydraulique maritime	450	57	—	—	507	410	206	—	—	616
Meteorology — Météorologie	1,189	—	131	5	1,325	1,492	—	155	11	1,658
Telecommunications and Electronics — Télécommunications et l'électronique	251	88	—	—	339	295	41	—	—	336
Sub-totals — Totaux partiels	1,915	145	131	5	2,196	2,227	247	170	11	2,655
Veterans Affairs — Affaires des anciens combattants	429	—	—	—	429	438	—	—	—	438
Other ¹ — Autres ¹	276	28	4	64	372	307	25	7	67	406
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	121,779	27,809	24,537	3,586	177,711	138,497	35,381	35,593	4,376	213,847
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	15,288	10,390	—	—	25,678	14,020	25,977	—	—	39,997
Defence Research Board — Conseil de recherches pour la défense.....	28,184	6,769	2,290	47	37,290	29,432	8,373	2,341	59	40,205
Sub-totals — Totaux partiels	43,472	17,159	2,290	47	62,968	43,452	34,350	2,341	59	80,202
All departments and agencies — Total — Tous les ministères et organismes	165,251	44,968	26,827	3,633	240,679	181,949	69,731	37,934	4,435	294,049

¹ Canadian Arsehals Limited, Central Mortgage and Housing Corporation, Post Office.¹ Arsenaux canadiens, Société centrale d'hypothèques et de logement, ministère des Postes.

TABLE 5 A. Federal Government Current Intra-mural Expenditures¹ on R & D in the Life Sciences, by Department or Agency, by Field of Science and by Type of R & D, Fiscal Year 1964-65

TABLÉAU 5 A. Dépenses courantes du gouvernement fédéral¹ en R & D *intra-muros* en sciences de la vie, par ministère ou organisme, par domaine scientifique et par type R & D, exercice 1964-65

Department or agency Ministère ou organisme	Scientific field — Domaine scientifique			Total	Type of R & D — Type de R & D		
	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales		Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement
	thousands of dollars — milliers de dollars						
Agriculture.....	26,240	353	—	26,593	2,712	21,311	2,570
Atomic Energy of Canada Limited	—	1,527	—	1,527	1,527	—	—
Fisheries — Pêcheries	—	7,575	—	7,575	—	6,563	1,012
Forestry — Forêts.....	4,545	1,399	—	5,944	699	4,476	769
National Health and Welfare — Santé nationale et Bien-être social	—	—	1,922	1,922	—	1,922	—
National Research Council — Conseil national de recherches	288	2,179	377	2,844	1,610	1,200	34
Northern Affairs and National Resources — Nord canadien et Ressources nationales	—	748	—	748	75	299	374
Secretary of State — Secrétariat d'État	—	132	—	132	132	—	—
Veterans Affairs — Affaires des anciens combattants	—	—	429	429	—	429	—
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	31,073	13,913	2,728	47,714	6,755	36,200	4,759
National Defence — Défense nationale	—	1,292	1,832	3,124	164	2,467	493
All departments and agencies — Total — Tous les ministères et organismes	31,073	15,205	4,560	50,838	6,919	38,667	5,252

¹ Excluding the costs of administering grants and contracts.

¹ Sans les frais d'administration des subventions et contrats.

TABLE 5 B. Federal Government Current Intra-mural Expenditures¹ on R & D in the Life Sciences, by Department or Agency, by Field of Science and by Type of R & D, Fiscal Year 1965-66

TABLÉAU 5 B. Dépenses courantes du gouvernement fédéral¹ en R & D *intra-muros* en sciences de la vie, par ministère ou organisme, par domaine scientifique et par type de R & D, exercice 1965-66

Department or agency — Ministère ou organisme	Scientific field — Domaine scientifique			Total	Type of R & D — Type de R & D		
	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales		Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement
	thousands of dollars — milliers de dollars						
Agriculture	28,286	421	—	28,707	2,922	23,032	2,753
Atomic Energy of Canada Limited	—	1,688	—	1,688	1,688	—	—
Fisheries — Pêcheries	—	8,877	—	8,877	—	7,755	1,122
Forestry — Forêts	5,048	1,553	—	6,601	777	4,970	854
National Health and Welfare — Santé nationale et Bien-être social	—	—	2,041	2,041	—	2,041	—
National Research Council — Conseil national de recherches	303	2,453	451	3,207	1,803	1,300	104
Northern Affairs and National Resources — Nord canadien et Ressources nationales	—	979	—	979	98	392	489
Secretary of State — Secrétariat d'État	—	140	—	140	140	—	—
Veterans Affairs — Affaires des anciens combattants	—	—	438	438	—	438	—
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	33,637	16,111	2,930	52,678	7,428	39,928	5,322
National Defence — Défense nationale	—	1,341	1,868	3,209	164	2,553	492
All departments and agencies — Total — Tous les ministères et organismes	33,637	17,452	4,798	55,887	7,592	42,481	5,814

¹ Excluding the costs of administering grants and contracts.

¹ Sans les frais d'administration des subventions et contrats.

TABLE 6. Federal Government Total Current Expenditures on R & D in the Life Sciences, by Department or Agency and by Field of Science

TABLÉAU 6. Dépenses courantes totales du gouvernement fédéral en R & D en sciences de la vie, par ministère ou organisme et par domaine scientifique

Department or agency — Ministère ou organisme	1964-65				1965-66			
	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales	Total	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales	Total
	thousands of dollars — milliers de dollars							
Agriculture	26,385	353	—	26,738	28,431	421	—	28,852
Atomic Energy of Canada Limited	—	1,547	—	1,547	—	1,708	—	1,708
Fisheries — Pêcheries	—	7,619	—	7,619	—	8,948	—	8,948
Forestry — Forêts	4,703	1,410	—	6,113	5,419	1,567	—	6,986
Medical Research Council — Conseil de la recherche médicale	—	—	5,954	5,954	—	—	10,897	10,897
National Health and Welfare — Santé nationale et Bien-être social	—	328	6,199	6,527	—	467	6,274	6,741
National Research Council — Conseil national de recherches	1,256	4,807	1,214	7,277	1,582	5,866	1,672	9,120
Northern Affairs and National Resources — Nord canadien et Ressources nationales	—	748	—	748	—	979	—	979
Secretary of State — Secrétaire d'État	—	171	—	171	—	204	—	204
Veterans Affairs — Affaires des anciens combattants	—	—	429	429	—	—	438	438
Other ¹ — Autres ¹	—	32	—	32	—	125	—	125
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	32,344	17,015	13,796	63,155	35,432	20,285	19,281	74,998
National Defence — Défense nationale	—	1,657	2,106	3,763	—	1,772	2,191	3,963
All departments and agencies — Total — Tous les ministères et organismes	32,344	18,672	15,902	66,918	35,432	22,057	21,472	78,961

¹ Central Mortgage and Housing Corporation, Departments of Industry and Transport.

¹ Société centrale d'hypothèques et de logement, ministères de l'Industrie et des Transports.

TABLE 7A. Federal Government Current Intra-mural Expenditures¹ on R & D in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1964-65

TABLÉAU 7A. Dépenses courantes du gouvernement fédéral¹ en R & D intra-muros en sciences physiques, par ministère ou organisme et par domaine scientifique, exercice 1964-65

Department or agency — Ministère ou organisme	All engineering — Tout génie	Chemistry — Chimie	Earth sciences — Sciences géologiques	Metal-lurgy — Métallurgie	Meteorology — Météorologie	Oceanography — Océanographie	Physics, nuclear — Physique nucléaire	Physics, non-nuclear — Physique non-nucléaire	Other — Autres	Total
	thousands of dollars — milliers de dollars									
Atomic Energy of Canada Limited	21,082	—	—	—	—	—	8,223	—	—	29,305
Fisheries — Pêcheries	993	95	—	—	—	373	—	—	—	1,461
Forestry — Forêts	489	350	—	—	—	—	—	210	—	1,049
Mines and Technical Surveys — Mines et Relevés techniques:										
Dominion Observatories — Observatoires fédéraux	—	—	1,630	—	—	—	—	619	366	2,615
Geographical Branch — Direction de la géographie	—	—	—	—	—	—	—	—	920	920
Geological Survey of Canada — Levés géologiques	—	254	3,814	—	—	—	—	170	—	4,238
Marine Sciences — Sciences de la mer	—	—	—	—	—	1,669	—	—	—	1,669
Mines	1,406	718	268	2,108	—	—	—	557	—	5,057
Polar Continental Shelf Project — Études du plateau continental polaire	2	—	48	—	—	—	—	12	—	62
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	819	819
Sub-totals — Totaux partiels	1,408	972	5,760	2,108	—	1,669	—	1,358	2,105	15,380
National Research Council — Conseil national de recherches	11,179	3,595	1,218	624	—	—	792	5,511	1,357	24,276
Transport — Transports	726	—	—	—	1,189	—	—	—	—	1,915
Other ² — Autres ²	326	—	—	—	—	—	—	—	—	326
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	36,203	5,012	6,978	2,732	1,189	2,042	9,015	7,079	3,462	73,712
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	12,207	165	—	—	—	533	—	1,231	—	14,136
Defence Research Board — Conseil de recherches pour la défense	10,570	4,932	282	282	564	1,127	—	8,455	—	26,212
Sub-totals — Totaux partiels	22,777	5,097	282	282	564	1,660	—	9,686	—	40,348
All departments and agencies — Total — Tous les ministères et organismes	58,980	10,109	7,260	3,014	1,753	3,702	9,015	16,765	3,462	114,060

¹ Excluding the costs of administering grants and contracts.

² Canadian Arsenal Limited, Post Office and National Film Board.

¹ Sans les frais d'administration des subventions et contrats.

² Arsenaux canadiens, ministère des Postes et Office national du film.

TABLE 7 B. Federal Government Current Intra-mural Expenditures¹ on R & D in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1965-66

TABLEAU 7 B. Dépenses courantes du gouvernement fédéral¹ en R & D intra-muros en sciences physiques, par ministère ou organisme et par domaine scientifique, exercice 1965-66

Department or agency — Ministère ou organisme	All engineering — Tout génie	Chemistry — Chimie	Earth sciences — Sciences géologiques	Metal-lurgy — Métallurgie	Meteor-ology — Météoro-logie	Ocean-ography — Océano-graphie	Physics, nuclear — Physique nucléaire	Physics, non-nuclear — Physique non-nucléaire	Other — Autres	Total
thousands of dollars — milliers de dollars										
Atomic Energy of Canada Limited	23, 193	—	—	—	—	—	10, 725	—	—	33, 918
Fisheries — Pêcheries	1, 435	117	—	—	—	484	—	—	—	2, 036
Forestry — Forêts	544	388	—	—	—	—	—	233	—	1, 165
Mines and Technical Surveys — Mines et Relevés techniques:										
Dominion Observatories — Observatoires fédéraux	—	—	1, 956	—	—	—	—	744	440	3, 140
Geographical Branch — Direction de la géographie	—	—	—	—	—	—	—	—	1, 069	1, 069
Geological Survey of Canada — Levés géologiques	—	280	4, 200	—	—	—	—	187	—	4, 667
Marine Sciences — Sciences de la mer	—	—	—	—	—	1, 761	—	—	—	1, 761
Mines	1, 514	685	332	2, 368	—	—	—	539	—	5, 438
Polar Continental Shelf Project — Etudes du plateau continental polaire	—	—	57	—	—	—	—	8	—	65
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	1, 093	1, 093
Sub-totals — Totaux partiels	1, 514	965	6, 545	2, 368	—	1, 761	—	1, 478	2, 602	17, 233
National Research Council — Conseil national de recherches	11, 815	3, 824	1, 283	590	—	—	852	5, 724	4, 394	28, 482
Transport — Transports	735	—	—	—	1, 493	—	—	—	—	2, 228
Other ² — Autres ²	328	—	—	—	—	—	—	—	—	328
All departments and agencies except National Defence Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	39, 564	5, 294	7, 828	2, 958	1, 493	2, 245	11, 577	7, 435	6, 996	85, 390
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	11, 243	164	—	—	—	433	—	1, 031	—	12, 871
Defence Research Board — Conseil de recherches pour la défense	11, 037	5, 151	294	294	589	1, 177	—	8, 830	—	27, 372
Sub-totals — Totaux partiels	22, 280	5, 315	294	294	589	1, 610	—	9, 861	—	40, 243
All departments and agencies — Total — Tous les ministères et organismes	61, 844	10, 609	8, 122	3, 252	2, 082	3, 855	11, 577	17, 296	6, 996	125, 633

¹ Excluding the costs of administering grants and contracts.

² Canadian Arsenals Limited, Post Office and National Film Board.

¹ Sans les frais d'administration des subventions et contrats.

² Arsenaux canadiens, ministère des Postes et Office national du film.

TABLE 8. Federal Government Current Intra-mural Expenditures¹ on R & D in the Physical Sciences, by Department or Agency and by Type of R & D

TABLEAU 8. Dépenses courantes du gouvernement fédéral¹ en R & D intra-muros en sciences physiques, par ministère ou organisme et par type de R & D

Department or agency — Ministère ou organisme	1964-65				1965-66			
	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement	Total	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Development — Développement	Total
thousands of dollars — milliers de dollars								
Atomic Energy of Canada Limited	8, 223	18, 142	2, 940	29, 305	10, 725	20, 071	3, 122	33, 918
Fisheries — Pêcheries	—	478	983	1, 461	—	594	1, 442	2, 036
Forestry — Forêts	—	769	280	1, 049	—	854	311	1, 165
Mines and Technical Surveys — Mines et Relevés techniques:								
Dominion Observatories — Observatoires fédéraux	1, 819	640	156	2, 615	2, 184	769	187	3, 140
Geographical Branch — Direction de la géographie	696	224	—	920	853	216	—	1, 069
Geological Survey of Canada — Levés géologiques	1, 483	2, 712	43	4, 238	1, 633	2, 987	47	4, 667
Marine Sciences — Sciences de la mer	—	1, 669	—	1, 669	—	1, 761	—	1, 761
Mines	1, 011	2, 124	1, 922	5, 057	1, 097	2, 255	2, 086	5, 438
Polar Continental Shelf Project — Etudes du plateau continental polaire	36	24	2	62	36	29	—	65
Water Resources — Ressources hydrauliques	—	819	—	819	—	1, 093	—	1, 093
Sub-totals — Totaux partiels	5, 045	8, 212	2, 123	15, 380	5, 803	9, 110	2, 320	17, 233
National Research Council — Conseil national de recherches	8, 711	12, 704	2, 861	24, 276	12, 213	13, 324	2, 945	28, 482
Transport — Transports	65	1, 320	530	1, 915	81	1, 480	667	2, 228
Other ² — Autres ²	—	—	326	326	—	—	328	328
All departments and agencies except National Defence Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	22, 044	41, 625	10, 043	73, 712	28, 822	45, 433	11, 135	85, 390
National Defence — Défense nationale:								
Canadian Forces — Forces canadiennes	—	1, 847	12, 289	14, 136	—	1, 546	11, 325	12, 871
Defence Research Board — Conseil de recherches pour la défense	—	26, 212	—	26, 212	—	27, 372	—	27, 372
Sub-totals — Totaux partiels	—	28, 059	12, 289	40, 348	—	28, 918	11, 325	40, 243
All departments and agencies — Total — Tous les ministères et organismes	22, 044	69, 684	22, 332	114, 060	28, 822	74, 351	22, 460	125, 633

¹ Excluding the costs of administering grants and contracts.

² Canadian Arsenals Limited, Post Office and National Film Board.

¹ Sans les frais d'administration des subventions et contrats.

² Arsenaux canadiens, ministère des Postes et Office national du film.

TABLE 9 A. Federal Government Total Current Expenditures on R & D in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1964-65

TABLEAU 9 A. Dépenses courantes totales du gouvernement fédéral en R & D en sciences physiques, par ministère ou organisme et par domaine scientifique, exercice 1964-65

Department or agency Ministère ou organisme	All engineering — Tout génie	Chemistry — Chimie	Earth sciences — Sciences géologiques	Metal-lurgy — Métallurgie	Meteorology — Météorologie	Oceanography — Océanographie	Physics, nuclear — Physique nucléaire	Physics, non-nuclear — Physique non nucléaire	Other — Autres	Total
thousands of dollars — milliers de dollars										
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	—	—	—	—	1,250	—	—	1,250
Atomic Energy of Canada Limited	25,814	—	—	—	—	—	8,335	—	—	34,149
Fisheries — Pêcheries	1,190	95	—	—	—	373	—	—	—	1,658
Forestry — Forêts	656	575	—	—	—	—	—	307	—	1,538
Industry — Industrie	20,406	—	—	121	—	—	—	—	—	20,527
Mines and Technical Surveys — Mines et Relevés techniques:										
Dominion Observatories — Observatoires fédéraux	—	—	1,630	—	—	—	—	619	366	2,615
Geographical Branch — Direction de la géographie	—	—	—	—	—	—	—	—	920	920
Geological Survey of Canada — Levés géologiques	—	254	3,914	—	—	—	—	170	—	4,338
Marine Sciences — Sciences de la mer	—	—	—	—	—	1,669	—	—	—	1,669
Mines	1,456	718	268	2,108	—	—	—	557	—	5,107
Polar Continental Shelf Project — Etudes du plateau continental polaire	28	—	48	—	—	—	—	12	—	88
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	819	819
Sub-totals — Totaux partiels	1,484	972	5,860	2,108	—	1,669	—	1,358	2,105	15,556
National Research Council — Conseil national de recherches	14,222	7,292	2,710	1,177	65	343	2,359	6,864	2,126	37,158
Transport — Transports	871	—	—	—	1,325	—	—	—	—	2,196
Other ¹ — Autres ¹	404	—	—	—	—	—	—	—	120	524
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	65,047	8,934	8,570	3,406	1,390	2,385	11,944	8,529	4,351	114,556
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	22,597	165	—	—	—	533	—	1,231	—	24,526
Defence Research Board — Conseil de recherches pour la défense	13,982	6,526	373	373	746	1,492	—	11,187	—	34,679
Sub-totals — Totaux partiels	36,579	6,691	373	373	746	2,025	—	12,418	—	59,205
All departments and agencies — Total — Tous les ministères et organismes	101,626	15,625	8,943	3,779	2,136	4,410	11,944	20,947	4,351	173,761

¹ Canadian Arsenals Limited, Central Mortgage and Housing Corporation, Northern Co-ordination and Research Centre, Post Office and National Film Board.

¹ Arsenaux canadiens, Société centrale d'hypothèques et de logement, Centre de coordination et recherches sur le nord, ministère des Postes et Office national du film.

TABLE 9 B. Federal Government Total Current Expenditures on R & D in the Physical Sciences, by Department or Agency and by Field of Science, Fiscal Year 1965-66

TABLEAU 9 B. Dépenses courantes totales du gouvernement fédéral en R & D en sciences physiques, par ministère ou organisme et par domaine scientifique, exercice 1965-66

Department or agency Ministère ou organisme	All engineering — Tout génie	Chemistry — Chimie	Earth sciences — Sciences géologiques	Metal-lurgy — Métallurgie	Meteorology — Météorologie	Oceanography — Océanographie	Physics, nuclear — Physique nucléaire	Physics, non-nuclear — Physique non nucléaire	Other — Autres	Total
thousands of dollars — milliers de dollars										
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	—	—	—	—	1,600	—	—	1,600
Atomic Energy of Canada Limited	28,532	—	—	—	—	—	10,854	—	—	39,386
Fisheries — Pêcheries	2,048	117	—	—	—	484	—	—	—	2,649
Forestry — Forêts	991	999	—	—	—	—	—	497	—	2,487
Industry — Industrie	26,565	—	—	137	—	—	—	—	—	26,702
Mines and Technical Surveys — Mines et Relevés techniques:										
Dominion Observatories — Observatoires fédéraux	—	—	1,958	—	—	—	—	752	440	3,150
Geographical Branch — Direction de la géographie	—	—	—	—	—	—	—	—	1,070	1,070
Geological Survey of Canada — Levés géologiques	—	280	4,350	—	—	—	—	187	—	4,817
Marine Sciences — Sciences de la mer	—	—	—	—	—	1,801	—	—	—	1,801
Mines	1,614	685	332	2,368	—	—	—	539	—	5,538
Polar Continental Shelf Project — Etudes du plateau continental polaire	13	—	57	—	—	—	—	8	—	78
Surveys and Mapping — Levés et la cartographie	6	—	—	—	—	—	—	—	—	6
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	1,093	1,093
Dominion Coal Board — Office fédéral du charbon	23	—	—	—	—	—	—	—	—	23
Sub-totals — Totaux partiels	1,656	965	6,697	2,368	—	1,801	—	1,486	2,603	17,576
National Research Council — Conseil national de recherches	16,093	8,904	3,210	1,251	83	413	2,073	7,503	5,718	45,248
Transport — Transports	982	—	—	—	1,658	—	—	—	—	2,640
Other ¹ — Autres ¹	386	—	—	—	—	—	—	—	175	561
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	77,253	10,985	9,907	3,756	1,741	2,698	14,527	9,486	8,496	138,849
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	37,220	164	—	—	—	433	—	1,031	—	38,848
Defence Research Board — Conseil de recherches pour la défense	15,077	7,036	402	402	804	1,608	—	12,062	—	37,391
Sub-totals — Totaux partiels	52,297	7,200	402	402	804	2,041	—	13,093	—	76,239
All departments and agencies — Total — Tous les ministères et organismes	129,550	18,185	10,309	4,158	2,545	4,739	14,527	22,579	8,496	215,088

¹ Canadian Arsenals Limited, Central Mortgage and Housing Corporation, Northern Co-ordination and Research Centre, Post Office and National Film Board.

¹ Arsenaux canadiens, Société centrale d'hypothèques et de logement, Centre de coordination et recherches sur le nord, ministère des Postes et Office national du film.

TABLE 10 A. Federal Government Total Current Expenditures on R & D, by Department or Agency and by General Area of R & D,
Fiscal Year 1964 - 65

TABLEAU 10 A. Dépenses courantes totales du gouvernement fédéral en R & D, par ministère ou organisme et par domaine
général de R & D, exercice 1964 - 65

Department or agency — Ministère ou organisme	Nuclear science — Science nucléaire	Space travel and communi- cations — Voyages et communi- cations spatiaux	Military science — Science militaire	Agriculture, fishing and forestry — Agriculture, pêche et forêtage	Con- struc- tion	Trans- portation — Trans- ports	Telecom- muni- cations — Télécom- muni- cations	Health and hygiene — Santé et hygiène	Industry — Indus- trie	Research on behalf of under- develop- ed areas — Recher- che pour le compte de régions en voie de deve- loppe- ment	Other — Autres	Total
thousands of dollars — milliers de dollars												
Agriculture	—	—	—	26,738	—	—	—	—	—	—	—	26,738
Atomic Energy Control Board — Commission de con- trôle de l'énergie atomique	1,250	—	—	—	—	—	—	—	—	—	—	1,250
Atomic Energy of Canada Limited	35,696	—	—	—	—	—	—	—	—	—	—	35,696
Fisheries — Pêcheries	—	—	—	9,277	—	—	—	—	—	—	—	9,277
Forestry — Forêts	—	—	—	7,651	—	—	—	—	—	—	—	7,651
Industry — Industrie	—	1,552	18,948	—	—	—	—	—	27	—	—	20,527
Medical Research Council — Conseil de la recherche médicale	—	—	—	—	—	—	—	5,954	—	—	—	5,954
Mines and Technical Surveys — Mines et Relevés tech- niques:												
Dominion Observatories — Observatoires fédéraux	—	—	—	—	—	—	—	—	—	—	2,615	2,615
Geographical Branch — Direction de la géographie	—	—	—	—	—	—	—	—	—	920	—	920
Geological Survey of Canada — Levés géologiques	—	—	—	—	—	—	—	—	—	4,338	—	4,338
Marine Sciences — Sciences de la mer	—	—	—	—	—	—	—	—	—	—	1,669	1,669
Mines	—	—	153	—	—	—	—	—	4,954	—	—	5,107
Polar Continental Shelf Project — Études du plateau continental polaire	—	—	—	—	—	—	—	—	—	—	88	88
Surveys and Mapping — Levés et la cartographie	—	—	—	—	—	—	—	—	—	—	—	—
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	—	—	819	819
Dominion Coal Board — Office fédéral du charbon	—	—	—	—	—	—	—	—	—	—	—	—
Sub-totals — Totaux partiels	—	—	153	—	—	—	—	—	4,954	5,258	5,191	15,556
National Health and Welfare — Santé nationale et Bien- être social	—	—	—	—	—	—	—	6,527	—	—	—	6,527
National Research Council — Conseil national de re- cherches	2,390	585	2,479	5,801	2,911	531	—	1,198	9,449	—	19,091 ¹	44,435
Northern Affairs and National Resources — Nord cana- dien et Ressources nationales	—	—	—	748	—	—	—	—	—	120	—	868
Transport — Transports	—	—	—	—	20	1,837	339	—	—	—	—	2,196
Veterans Affairs — Affaires des anciens combattants ..	—	—	—	—	—	—	—	429	—	—	—	429
Other ² — Autres ²	—	—	107	—	14	—	—	32	64	—	390	607
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense na- tionale	39,336	2,137	21,687	50,215	2,945	2,368	339	14,140	14,494	5,378	24,672	177,711
National Defence — Défense nationale:												
Canadian Forces — Forces canadiennes	—	—	25,678	—	—	—	—	—	—	—	—	25,678
Defence Research Board — Conseil de recherches pour la défense	—	2,576	33,595	—	—	—	—	1,119	—	—	—	37,290
Sub-totals — Totaux partiels	—	2,576	59,273	—	—	—	—	1,119	—	—	—	62,968
All departments and agencies — Total — Tous les ministères et organismes	39,336	4,713	80,960	50,215	2,945	2,368	339	15,259	14,494	5,378	24,672	240,679

¹ Largely non-oriented basic research.

² Canadian Arsenals Limited, Central Mortgage and Housing Corpora-
tion, Post Office, National Film Board and National Museum.

¹ En majeure partie la recherche fondamentale non orientée.

² Arsenaux canadiens, Société centrale d'hypothèques et de logement,
ministère des Postes, Office national du film et Musée national du
Canada.

TABLE 10 B. Federal Government Total Current Expenditures on R & D, by Department or Agency and by General Area of R & D, Fiscal Year 1965-66

TABLÉAU 10 B. Dépenses courantes totales du gouvernement fédéral en R & D, par ministère ou organisme et par domaine général de R & D, exercice 1965-66

Department or agency Ministère ou organisme	Nuclear science Science nucléaire	Space travel and communications Voyages et communications spatiaux	Military science Science militaire	Agriculture, fishing and forestry Agriculture, pêche et foresterie	Construction Construction	Transportation Transports	Telecommunications Télécommunications	Health and hygiene Santé et hygiène	Industry Industrie	Research on behalf of under-developed areas Recherche pour le compte de régions en voie de développement	Other Autres	Total
thousands of dollars — milliers de dollars												
Agriculture	—	—	—	28,852	—	—	—	—	—	—	—	28,852
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	1,600	—	—	—	—	—	—	—	—	—	—	1,600
Atomic Energy of Canada Limited	41,094	—	—	—	—	—	—	—	—	—	—	41,094
Fisheries — Pêcheries	—	—	—	11,597	—	—	—	—	—	—	—	11,597
Forestry — Forêts	—	—	—	9,473	—	—	—	—	—	—	—	9,473
Industry — Industrie	9	3,441	21,550	—	—	—	—	—	1,742	—	—	26,742
Medical Research Council — Conseil de la recherche médicale	—	—	—	—	—	—	—	10,897	—	—	—	10,897
Mines and Technical Surveys — Mines et relevés techniques:												
Dominion Observatories — Observatoires fédéraux	—	—	—	—	—	—	—	—	—	—	3,150	3,150
Geographical Branch — Direction de la géographie....	—	—	—	—	—	—	—	—	—	1,070	—	1,070
Geological Survey of Canada — Levés géologiques....	—	—	—	—	—	—	—	—	—	4,817	—	4,817
Marine Sciences — Sciences de la mer	—	—	—	—	—	—	—	—	—	—	1,801	1,801
Mines	—	—	176	—	—	—	—	—	5,362	—	—	5,538
Polar Continental Shelf Project — Études du plateau continental polaire	—	—	—	—	—	—	—	—	—	—	78	78
Surveys and Mapping — Levés et la cartographie	—	—	—	—	—	—	—	—	—	—	6	6
Water Resources — Ressources hydrauliques	—	—	—	—	—	—	—	—	—	—	1,093	1,093
Dominion Coal Board — Office fédéral du charbon	—	—	—	—	—	—	—	—	23	—	—	23
Sub-totals — Totaux partiels	—	—	176	—	—	—	—	—	5,385	5,887	6,128	17,576
National Health and Welfare — Santé nationale et Bien-être social	—	—	—	—	—	—	—	6,741	—	—	—	6,741
National Research Council — Conseil national de recherches	2,165	3,017	2,452	7,034	3,045	567	—	1,655	11,602	—	22,831 ¹	54,368
Northern Affairs and National Resources — Nord canadien et Ressources nationales	—	—	—	979	—	—	—	—	—	175	—	1,154
Transport — Transports	—	—	—	—	20	2,299	336	—	—	—	—	2,655
Veterans Affairs — Affaires des anciens combattants	—	—	—	—	—	—	—	438	—	—	—	438
Other ² — Autres ²	—	—	88	—	18	—	—	70	50	—	434	660
All departments and agencies except National Defence — Total — Tous les ministères et organismes à l'exclusion de la Défense nationale	44,868	6,458	24,266	57,935	3,083	2,866	336	19,801	18,779	6,062	29,393	213,847
National Defence — Défense nationale:												
Canadian Forces — Forces canadiennes	—	—	39,997	—	—	—	—	—	—	—	—	39,997
Defence Research Board — Conseil de recherches pour la défense	—	2,990	36,009	—	—	—	—	1,206	—	—	—	40,205
Sub-totals — Totaux partiels	—	2,990	76,006	—	—	—	—	1,206	—	—	—	80,202
All departments and agencies — Total — Tous les ministères et organismes	44,868	9,448	100,272	57,935	3,083	2,866	336	21,007	18,779	6,062	29,393	294,049

¹ Largely non-oriented basic research.

² Canadian Arsenals Limited, Central Mortgage and Housing Corporation, Post Office, National Film Board and National Museum.

¹ En majeure partie la recherche fondamentale non orientée.

² Arsenaux canadiens, Société centrale d'hypothèques et de logement, ministère des Postes, Office national du film et Musée national du Canada.

TABLE 11. Federal Government Current Intra-mural Expenditures on R & D,¹ by Field of Science and Type of R & D
TABLEAU 11. Dépenses courantes du gouvernement fédéral en R & D intra-muros¹, par domaine scientifique et par type de R & D

Scientific field — Domaine scientifique	1964-65				1965-66			
	Basic research — Recherche fonda- mentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total	Basic research — Recherche fonda- mentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total
	thousands of dollars — milliers de dollars							
Physical sciences — Sciences physiques:								
Engineering — Génie:								
Aeronautical — Aéronautique	351	1,883	7,799	10,033	380	2,013	7,789	10,182
Chemical — Chimique	—	1,552	297	1,849	—	1,713	293	2,006
Civil	—	1,420	92	1,512	—	1,498	98	1,596
Electrical and electronic — Électrique et électronique	522	8,067	724	9,313	657	8,316	736	9,709
Hydraulic — Hydraulique	86	1,407	579	2,072	91	1,412	605	2,108
Mechanical — Mécanique	524	4,671	1,401	6,596	563	4,931	1,496	6,990
Mining — Minier	—	174	768	942	—	185	849	1,034
Other — Autres	53	18,262	8,348	26,663	55	20,198	7,966	28,219
Sub-totals — Totaux partiels	1,536	37,436	20,008	58,980	1,746	40,266	19,832	61,844
Astronomy — Astronomie	1,207	268	39	1,514	1,417	345	47	1,809
Chemistry — Chimie	2,389	7,442	278	10,109	2,573	7,720	316	10,609
Earth sciences — Sciences géologiques	2,905	4,144	211	7,260	3,268	4,611	243	8,122
Mathematics — Mathématiques	67	—	—	67	71	—	—	71
Metallurgy — Métallurgie	429	1,711	874	3,014	467	1,783	1,002	3,252
Meteorology — Météorologie	65	1,429	259	1,753	81	1,649	352	2,082
Oceanography — Océanographie	—	3,702	—	3,702	—	3,855	—	3,855
Physics, nuclear — Physique nucléaire	8,748	233	34	9,015	11,299	242	36	11,577
Physics, non-nuclear — Physique non nucléaire	3,868	12,276	621	16,765	4,112	12,571	613	17,296
Other — Autres	830	1,043	8	1,881	3,788	1,309	19	5,116
Physical sciences — Total — Sciences physiques	22,044	69,684	22,332	114,060	28,822	74,351	22,460	125,633
Life sciences — Sciences de la vie:								
Agricultural sciences — Sciences agricoles:								
Agronomy and animal husbandry — Agronomie et élevage	2,018	15,571	1,937	19,526	2,159	16,669	2,073	20,901
Forestry — Sylviculture	350	3,496	699	4,545	388	3,883	777	5,048
Other — Autres	653	5,737	612	7,002	698	6,335	655	7,688
Sub-totals — Totaux partiels	3,021	24,804	3,248	31,073	3,245	26,887	3,505	33,637
Biological sciences — Sciences biologiques	3,630	9,982	1,593	15,205	4,074	11,534	1,844	17,452
Medical sciences — Sciences médicales	268	3,881	411	4,560	273	4,060	465	4,798
Life sciences — Total — Sciences de la vie	6,919	38,667	5,252	50,838	7,592	42,481	5,814	55,887
All fields — Total — Tous les domaines	28,963	108,351	27,584	164,898	36,414	116,832	28,274	181,520

¹ Excluding the costs of administering grants and contracts.

¹ Sans les frais d'administration des subventions et contrats.

TABLE 12. Professional Personnel Employed by the Federal Government in the Conduct of R & D,¹ by Field and Level of Training, 1965²
TABLEAU 12. Professionnels employés par le gouvernement fédéral dans l'exécution de la R & D¹, par domaine et degré de formation, 1965²

Field of scientific training — Domaine de formation scientifique	Level of training — Degré de formation			Total	Full-time equivalent — Équivalent à plein temps
	Bachelor — Baccalauréat	Master — Maîtrise	Doctorate — Doctorat		
Physical sciences — Sciences physiques:					
Engineering — Génie:					
Aeronautical — Aéronautique	12	23	3	38	38
Chemical — Chimique	101	23	17	141	139
Civil	48	27	3	78	73
Electrical and electronic — Électrique et électronique	154	73	22	249	248
Hydraulic — Hydraulique	34	9	1	44	44
Mechanical — Mécanique	183	55	16	254	250
Other ³ — Autres ³	60	24	7	91	91
Sub-totals — Totaux partiels	592	234	69	895	883
Chemistry — Chimie	147	71	259	477	466
Earth sciences — Sciences géologiques	152	40	180	372	288
Mathematics — Mathématiques	36	28	15	79	76
Metallurgy — Métallurgie	51	18	27	96	96
Meteorology — Météorologie	16	29	7	52	52
Physics, nuclear — Physique nucléaire	14	23	53	90	90
Physics, non-nuclear — Physique non nucléaire	109	83	193	385	382
Other ⁴ — Autres ⁴	24	36	34	94	89
Physical sciences — Total — Sciences physiques	1,141	562	837	2,540	2,422

TABLE 12. Professional Personnel Employed by the Federal Government in the Conduct of R & D,¹ by Field and Level of Training, 1965² - Concluded

TABLEAU 12. Professionnels employés par le gouvernement fédéral dans l'exécution de la R & D¹, par domaine et degré de formation, 1965² - fin

Field of scientific training — Domaine de formation scientifique	Level of training — Degré de formation			Total	Full-time equivalent — Équivalent à plein temps
	Bachelor — Baccalauréat	Master — Maîtrise	Doctorate — Doctorat		
Life sciences - Sciences de la vie:					
Agricultural sciences - Sciences agricoles:					
Agronomy and animal husbandry - Agronomie et élevage	113	161	320	594	594
Forestry - Sylviculture	49	56	17	122	112
Other - Autres	66	68	107	241	224
Sub-totals - Totaux partiels	228	285	444	957	930
Biological sciences - Sciences biologiques	117	155	247	519	480
Medical sciences - Sciences médicales	200	46	217	463	188
Life sciences - Total - Sciences de la vie	545	486	908	1,939	1,598
Administrators of R & D - Administrateurs de la R & D	81	47	124	252	244
All fields - Total - Tous les domaines	1,767	1,095	1,869	4,731	4,264

¹ Excluding those working for the Canadian Forces.

² Permanent staff as of March 31 1965, plus seasonal and casual personnel employed during the year.

³ Includes mining engineers (21).

⁴ Includes astronomers (19) and oceanographers (29).

¹ À l'exclusion de ceux qui travaillent pour les Forces canadiennes.

² Personnel permanent au 31 mars 1965, plus le personnel saisonnier et d'occasion employé au cours de l'année.

³ Inclus les ingénieurs miniers (21).

⁴ Inclus les astronomes (19) et les océanographes (29).

TABLE 13. Personnel Employed by the Federal Government in the Conduct of R & D, by Major Department or Agency,¹ 1965²

TABLEAU 13. Effectifs employés par le gouvernement fédéral dans l'exécution de la R & D, par ministère ou organisme principal¹, 1965²

Department or agency — Ministère ou organisme	Professional personnel — Professionnels					Supporting personnel — Auxiliaires					Total number — Nombre total	Full- time equiva- lent — Équiva- lent à plein temps
	Bachelor — Baccalauréat	Master — Maîtrise	Doctor — Doctorat	Total	F.T.E. — E.P.T.	Techni- cians — Techni- ciens	Skilled workers — Arti- sans specia- lisés	Other — Autres	Total	F.T.E. — E.P.T.		
Agriculture ³	193	246	486	925	905	908	108	2,140	3,156	3,085	4,081	3,990
Atomic Energy of Canada Limited	280	75	112	467	467	686	1,002	728	2,416	2,416	2,883	2,883
Defence Research Board — Conseil de recher- ches pour la défense	226	177	158	561	561	738	93	1,132	1,963	1,963	2,524	2,524
Fisheries — Pêcheries	116	98	82	296	274	405	10	286	701	609	997	883
Forestry — Forêts	105	108	141	354	328	617	2	105	724	525	1,078	853
Mines and Technical Surveys ⁴ — Mines et Rele- vés techniques ⁴	425	123	283	831	727	408	128	671	1,207	848	2,038	1,575
National Health and Welfare — Santé nationale et Bien-être social	192	36	157	385	132	275	—	139	414	154	799	286
National Research Council — Conseil national de recherches	152	167	362	681	681	699	293	781	1,773	1,773	2,454	2,454
Transport — Transports	39	34	10	83	80	73	4	18	95	93	178	173
Other — Autres	39	31	78	148	109	79	19	67	165	149	313	258
Totals — Totaux	1,767	1,095	1,869	4,731	4,264	4,888	1,659	6,067	12,614	11,615	17,345	15,879

¹ Excluding the Canadian Forces.

² Permanent staff as of March 31 1965, plus seasonal and casual personnel employed during the year.

³ Estimates of personnel in 1963 were too high. Probably the estimates for 1963 should be slightly below those for 1965.

⁴ Not comparable to estimates for previous years; personnel of the Geographical Branch and the Water Resources Branch are now included.

¹ À l'exclusion des Forces canadiennes.

² Personnel permanent au 31 mars 1965, plus le personnel saisonnier et d'occasion employé au cours de l'année.

³ Les estimés du personnel en 1963 étaient trop élevés. Il est probable que les estimés pour 1963 devraient être légèrement inférieurs à ceux de 1965.

⁴ Non comparables aux estimés des années antérieures; le personnel de la Direction de la géographie et celui de la Direction des ressources hydrauliques sont maintenant inclus.

QUESTIONNAIRE

Complete in duplicate. Keep one copy for your files
and return one copy in the enclosed envelope to the
Dominion Bureau of Statistics, Ottawa.

FOR IMMEDIATE ATTENTION

DOMINION BUREAU OF STATISTICS

Business Finance Division

**FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES**

FISCAL YEAR 1964-65 ACTUAL

AND ESTIMATES 1965-66

This survey is being conducted in cooperation with the National Research Council, in an effort to assess the magnitude and direction of the federal government scientific program.

It is desired to publish the results of this survey in detail giving figures for each reporting unit. Permission is requested to consider all information reported on this form as available for publication. If your unit does not wish to give this permission please indicate in an accompanying letter.

Complete the questionnaire as fully as possible. If precise figures are not available, your best estimates will be satisfactory. Address enquiries to Business Finance Division, Dominion Bureau of Statistics.

Name of reporting unit _____

Name of person making this report _____ Telephone _____ Date _____
(Please print)

A. IDENTIFICATION OF FUNDS FOR SCIENTIFIC ACTIVITIES

Source of Funds	Funds	
	Actual expenditures 1964-65	Estimated expenditures 1965-66
	thousands of dollars	
1. Funds available as a result of annual estimates		
2. Cost of indirect support		
3. Transfers from other units of your dept. or agency (identify)		
.....		
.....		
4. Transfers from other depts. or agencies of the Federal Government (identify)		
.....		
.....		
5. Funds received from other sources (identify)		
.....		
.....		
Sub-totals		
Deduct:		
6. Transfers to other units of your dept. or agency (identify)		
.....		
7. Transfers to other depts. or agencies of the Federal Government (identify)		
.....		
.....		
8. Support provided non-scientific activities		
Sub-totals		
TOTAL FUNDS AVAILABLE		

A. IDENTIFICATION OF FUNDS

Definitions

Scientific activities – all activities in the natural sciences concerned with the creation of new knowledge, new applications of knowledge to useful purposes, or the furtherance of both the creation of new knowledge or new applications. Routine applications of scientific knowledge or skills are NOT included, except when these are related to the creation and furtherance of new knowledge or applications. The social and psychological sciences are NOT included in this survey.

If required at this time, definitions of the various types of scientific activity may be found in the definitions sections of questions B and C.

Instructions

A1 Funds available as a result of annual estimates. These are funds allotted to the department or agency by parliament. The 1964-65 expenditures would be the expenditures prepared for the Public Accounts by the department. The 1965-66 expenditures should be the sub-allotments when available, otherwise the estimates and supplementary estimates must be used.

A2 Cost of indirect support. This is mainly funds administered by other departments or agencies which are used for the benefit of your scientific activities. The departments involved are usually Public Works, Finance, Labour and the Post Office. Overhead costs at remote sites are to include net costs of requisite services such as housing, restaurants and utilities.

The relevant proportion of the value of the accommodation provided by your own department is also to be included.

A3 Transfers from other units of your dept. or agency. This includes all funds transferred from other units in support of your scientific activities. If this questionnaire is being completed at department or agency level this question is not applicable.

A4 Transfers from other depts. or agencies. These are funds received for the scientific activities of your organization from other departments or agencies.

A5 Funds received from other sources. These are mainly funds received as a result of sales or contracts and which are applied to the scientific activities of the unit, department or agency.

A6, A7 Transfers. All funds allocated to your organization which have been transferred to others within the Federal Government for scientific activities.

A8 Support provided non-scientific activities. Any portion of the funds shown in the answers to A1 to A5 which have been spent on non-scientific activities must be included here.

Time periods – The years 1964-65 and 1965-66 are the fiscal years April 1 to March 31.

General – If there is not sufficient space allowed for the names requested in A3 – A7, please put the total amount of the transfer in the applicable space and attach a separate sheet with the required names to your return.

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

Type of Scientific Activity	Performers					Total
	Reporting unit	Profit organizations	Educational institutions	Other non-profit institutions	Other	
			thousands of dollars			
Actual expenditures 1964-65						
1. R & D costs						
2. Grants-in-aid of research						
Sub-totals						
3. Capital expenditures on R & D plant....						
4. Capital expenditures on plant for other scientific activities						
5. Scientific data collection						
6. Scientific information						
7. Scholarship and fellowship programs						
TOTAL EXPENDITURES						
Estimated expenditures 1965-66						
1. R & D costs						
2. Grants-in-aid of research						
Sub-totals						
3. Capital expenditures on R & D plant						
4. Capital expenditures on plant for other scientific activities						
5. Scientific data collection						
6. Scientific information						
7. Scholarship and fellowship programs						
TOTAL EXPENDITURES						

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

Definitions

R & D — consists of basic research, applied research and development.

Research is investigative, experimental and generally original work undertaken primarily for the advancement of scientific knowledge. There may, or may not, be a specific practical application in view.

Development is the use of the results of research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. It includes the design, construction and testing of pilot plants and prototypes.

(More extensive notes on research and development are in the definitions of question C.)

Grants-in-aid of research — grants which are expressly designated as being in support of scientific research.

Capital expenditures — expenditures on land, buildings, facilities and major equipment used for either R & D or other scientific activities.

Reporting unit — any department or agency, or part of a department or agency, for which a questionnaire is completed.

Profit organizations — Canadian business enterprises, research institutions and trade associations operated by industries for their own benefit, public utilities and other commercial-type corporations owned by Canadian governments.

Educational institutions — Canadian universities and colleges.

Other non-profit institutions — institutions and foundations conducting some scientific activity and not primarily designed to make a profit or to provide profit organizations with research results.

Others — includes all foreign recipients of Federal Government funds for scientific activities, units of the Federal Government performing scientific activities for the reporting unit without a precedent transfer of funds (cf. A6 and A7), and units of provincial or municipal government receiving funds for scientific activities.

Instructions

B1 R & D costs. Include all expenditures which are attributable to R & D as defined above. Remember to include the costs of planning and administering R & D. Depreciation of capital equipment is NOT to be included here or elsewhere as a cost of R & D, nor is R & D into the social and psychological sciences to be considered.

B2 Grants-in-aid of research. Include the costs of administering such programs. The performer of such administration would be usually the reporting unit. The

performer of the research is normally an education institution or an industry (profit organization).

B3 Capital expenditures on R & D plant. Only the amounts estimated to be spent or actually spent during the years 1964-65 and 1965-66 are to be reported. Capital R & D expenditures for multi-purpose plant should be based on the proportion of the plant used for R & D.

B4 Capital expenditures on plant for other scientific activities. The expenditures on plant used for scientific data collection or the processing, indexing, cataloguing and dissemination of scientific information. When this plant is also used for other purposes, only the relevant proportion of capital expenditures may be given.

B5 Scientific data collection. This is the cost of collecting scientific data on natural phenomena. It includes data used for mapping; collection of geologic, hydrologic, geo-magnetic, meteorologic, astronomic and other physical data; and the collection of entomological specimens and other biologic data. Exclude data collection done in the course of carrying out a specific R & D project or program as this activity should be included under the conduct of R & D. Exclude also data collection done solely for internal operating purposes. If, however, these data are made available for general use, additional costs of material and personnel are to be included. The presentation of these data in reports, maps and other publications is included under the dissemination of scientific information described below.

B6 Scientific information. This includes the costs of library operations, translation, procurement and publication services in connection with information required in, or resulting from, scientific activities; standardization of terminology and the making of scientific or technical glossaries; and the support, including travel allowances, of scientific conferences and symposia.

B7 Scholarship and fellowship programs. Costs, including administrative costs, of scholarships and fellowships granted to persons who are or who will be engaged in a scientific activity. The reporting unit would normally be a performer in respect of the costs of its administration of such a program. An educational institution is normally the performer of the scientific activity.

General

(a) The row total of the column "total" must equal the total funds provided in question A for each of the years 1964-65 and 1965-66.

(b) If you are aware that the recipient of funds for a scientific activity did not perform the activity but allocated it to some other performer, please complete this question for the ultimate performer.

(c) List all the performers of extra-mural R & D on the sheets of the annex for this question.

C. FIELD OF RESEARCH

1. Intra-mural R & D Expenditures

2. Total Current R & D Expenditures

Field of Research	Actual expenditures 1964-65			Estimated expenditures 1965-66			Actual expenditures 1964-65			Estimated expenditures 1965-66		
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Applied research	Development
	thousand of dollars			thousand of dollars			thousand of dollars			thousand of dollars		
Physical sciences:												
Engineering:												
Aeronautical												
Chemical												
Civil												
Electrical and electronic												
Hydraulic												
Mechanical												
Mining												
Other (identify)												
Sub-totals												
Other physical sciences:												
Astronomy												
Chemistry												
Geology, geophysics and other earth sciences												
Mathematics												
Metallurgy												
Meteorology												
Oceanography												
Physics, nuclear												
Physics, non-nuclear												
Other (identify)												
TOTALS, ALL PHYSICAL SCIENCES												
Life Sciences:												
Agricultural sciences:												
Agronomy												
Animal husbandry												
Forestry												
Veterinary science												
Other (identify)												
Biological sciences:												
Biology, bio-chemistry, bio-physics												
Other (identify)												
Medical sciences:												
Dentistry												
Medicine												
Pharmacy												
TOTALS, ALL LIFE SCIENCES												
TOTALS, ALL FIELDS OF RESEARCH												

C. FIELD OF RESEARCH

Definitions

Field of research — divided into two groups:

- (a) The **physical sciences**, which consist of those sciences concerned primarily with understanding the natural phenomena associated with non-living things; mathematics, pure and applied; and the engineering sciences, which are concerned with studies directed toward developing scientific principles usable in engineering practice.
- (b) The **life sciences**, which are those sciences dealing with the physical processes and characteristics of all living matter. They include agriculture, which is directed toward understanding and improving agricultural productivity; the biological sciences, which study the life processes and classify living organisms; and medicine, which comprises those sciences that, apart from the strictly clinical aspects of professional medicine, are concerned primarily with the utilization of scientific principles in understanding human diseases and in maintaining and improving human health.

Basic research is work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view.

Applied research is work undertaken primarily for the advancement of scientific knowledge, but with a specific practical aim in view.

Practical distinctions between basic and applied research may be based on the **aim**, the **method** and the **results** of the research.

The aims of basic and applied research are different. The aim of basic research is to satisfy curiosity or to extend theoretical knowledge; the object of applied research is to solve a particular problem, to improve an existing product or process or to enable a discovery or existing knowledge to be used in a specific situation or area.

The methods of research will often be different. In basic research the investigators will be less restricted in the subject and direction of their work than will be the case in applied research. Basic research is probably conducted as an individual project rather than a group project often more than is the case in applied research.

The results of the two types of research may well be different. The findings of a basic research project are more likely to have a broad, fundamental significance. They may lead to a multiple number of applications, whereas the results of applied research will often be of use only to a particular area or project.

Development is the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. Difficulty is often experienced in distinguishing between development and production costs.

The criterion must be the reason for which the work is undertaken. If the primary aim is to improve the quality of the product or process, the relevant expenditures are for development. If the primary motive is to get the production process set up, the work is NOT development.

The design, construction and testing of prototypes is R & D, but the costs of trial production runs are NOT development costs. After an original prototype has been successfully tested and no more development work is required, limited scale manufacture of the item, even though they may still be called "prototypes", cannot be included in development.

The cost of changes in design made necessary because of changed fashions or styles unaccompanied by technological innovation is NOT R & D.

Once the experimental phase of a pilot plant is over, it may be operated as a productive unit. As soon as the primary purpose in operating a pilot plant is for production, the costs of operation may no longer be attributed to development.

Instructions

(a) In Part 1, consider only your "in house" expenditures, i.e., row B1, Column "Reporting unit" of Question B.

(b) In Part 2, consider all current R & D expenditures by your department, i.e., the total of B1 and B2.

D. PERSONNEL EMPLOYED IN R & D

The number of persons engaged in the conduct of R & D in your unit, department or agency as of 31 March 1965.

1. Scientists and engineers

Field of Training	Level of training			Total number employed	Full-time equivalent
	Bachelor	Master	Doctorate		
Physical scientists:					
Aeronautical engineering					
Chemical					
Civil					
Electrical and electronic					
Hydraulic					
Mechanical					
Mining					
Other engineering (identify)					
.....					
Sub-totals					
Astronomy					
Chemistry					
Geology, geophysics and other earth sciences					
Mathematics					
Metallurgy					
Meteorology					
Oceanography					
Physics, nuclear					
Physics, non-nuclear					
Others (identify)					
.....					
Totals, physical scientists					
Life scientists:					
Agricultural sciences:					
Agronomy					
Animal husbandry					
Forestry					
Veterinary science					
Other (identify)					
Biological sciences:					
Biology, bio-chemistry, bio-physics					
Other (identify)					
Medical sciences:					
Dentistry					
Medicine					
Pharmacy					
Totals, life scientists					
Administrators of R & D					
Totals, all scientists and engineers					

2. Supporting personnel

	Total number	Full-time equivalent
R & D technicians		
Skilled craftsmen		
Other supporting personnel		
Total, supporting personnel		

D. PERSONNEL EMPLOYED IN R & D

Definitions

Field of training — the branch of engineering or the field of science in which each person in your organization, engaged in the conduct of R & D, trained in preparation for his highest academic degree or professional qualification.

Level of training — the highest academic degree of each of the persons engaged in the conduct or administration of R & D. Those employed as scientists and engineers who do not have a university degree but possess an equivalent diploma or who have the qualifications required for admission to their professional society will normally be considered as being at the bachelor level of training.

Full-time equivalent — full-time employment on scientific activities is considered as being about 30 hours (or more) a week, excluding normal holidays. This time need not be spent only in the laboratory or project area, but might include time spent in administering R & D, using the library or recruiting other R & D workers. For example, a scientist who normally spends 40 hours a week on such activities is considered one full-time unit, but two scientists, each devoting 20 hours a week to R & D, would be considered one and one-third full-time units.

Supporting personnel — there are three classes of supporting personnel.

a) **R & D Technicians** are technical personnel having high school graduation or equivalent and with additional technical training, who assist scientists and engineers in R & D work (e.g. draughtsmen, laboratory assistants, electronic technicians).

b) **Skilled craftsmen** are workers in positions requiring specialized training or experience and who are engaged in R & D work (e.g. glass blowers, machinists, model makers).

c) **Other supporting personnel** are all other persons whose pay is included in the direct cost of the conduct of R & D or the administration of grants-in-aid of research (e.g. clerical staff and apprentices, but NOT janitors or canteen attendants).

Instructions

Full-time equivalent — to derive the full-time equivalent, it is recommended that you first consider how many people are employed full time in the conduct or administration of R & D, and then add an estimate of the full-time equivalent of the remainder.

Administrators of R & D — do not consider their field of training but describe them only by their highest degree or professional qualification.

Seasonal staff — if the employment in R & D within your unit, department or agency varied by more than 10% during the fiscal year 1964-65, please estimate the deviation from the figure for March 31, 1965.

(a) If there was a total employment in R & D of 90% or less of the March 31 employment during 1964-65, please estimate the average number of R & D workers, professionals and supporting personnel, employed during the year.

(b) If the total employment exceeded the March 31 figure by 10% or more, estimate, on a separate sheet of paper, the man-year equivalent of the excess (presumably seasonal staff). Consider one year as equal to 48 weeks. Give this man-year equivalent for the applicable fields of training for those employed as professionals. Also give the man-year equivalent for those who were employed as supporting personnel. For example, if your organization hired 15 chemistry undergraduates for R & D for the period May 15 to September 1, of whom 10 were used at the professional level and 5 were employed as supporting personnel, the correct man-year estimates would be 2.75 man-years at the professional level for the field of training of chemistry and 1.38 man-years for supporting personnel.

NOTE: Only personnel engaged in the conduct or administration of R & D are to be considered. Do NOT include personnel engaged in the other scientific activities.

E. GENERAL AREA OF R & D
Current expenditures on R & D

Area	Actual expenditures 1964-65		Estimated expenditures 1965-66	
	%	Amount. (thousands of dollars)	%	Amount (thousands of dollars)
Nuclear science				
Space travel and communications				
Military science (excluding nuclear and space)				
Other:				
Agriculture, fishing and forestry				
Construction and building				
Transportation: roads and bridges, merchant marine, civil aviation and meteorology				
Telecommunications				
Health and hygiene				
Industry, including mining				
Research on behalf of underdeveloped areas				
Other (please specify)				
.....				
Total current R & D expenditures				

Instructions: The total R & D current expenditures must equal the sum of the totals of R & D costs and grants-in-aid of research of question B.

CATALOGUE No.

13-401

BIENNIAL - BISANNUEL



FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES
FISCAL YEAR 1966-67

DÉPENSES DE L'ADMINISTRATION FÉDÉRALE
EN ACTIVITÉS SCIENTIFIQUES
EXERCICE 1966-67

DOMINION BUREAU OF STATISTICS

BUREAU FÉDÉRAL DE LA STATISTIQUE

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Federal Government Expenditures on Scientific Activities,Fiscal Year 1966-67

The statistical data contained in this publication were compiled in the spring of 1968. As a result of subsequent changes in estimating procedures which several departments have recently adopted, it seems probable that these data will be substantially revised in later issues of this publication.

Dépenses de l'administration fédérale en activités scientifiques,exercice 1966-67

Depuis que les résultats de notre dernière enquête ont été compilés, soit au printemps de 1968, il s'est effectué certains changements dans la comptabilité des dépenses pour fins d'activités scientifiques de quelques ministères. Par conséquent, il est probable que notre prochaine publication contienne des révisions aux chiffres inclus dans le présent rapport.

DOMINION BUREAU OF STATISTICS — BUREAU FÉDÉRAL DE LA STATISTIQUE

Business Finance Division — Division des finances des entreprises

Scientific Activities Surveys Section — Section des enquêtes sur les activités scientifiques

FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES

FISCAL YEAR 1966-67

DÉPENSES DE L'ADMINISTRATION FÉDÉRALE
EN L'ACTIVITÉS SCIENTIFIQUES

EXERCICE 1966-67

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The Minister of Trade and Commerce

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le ministre du Commerce

SYMBOLS

The following standard symbols are used in Dominion Bureau of Statistics publications:

- .. figures not available.
- ... figures not appropriate or not applicable.
- nil or zero.
- amount too small to be expressed.
- Ⓟ preliminary figures.
- Ⓡ revised figures.

SIGNES CONVENTIONNELS

Les signes conventionnels suivants sont employés uniformément dans les publications du Bureau fédéral de la statistique.

- .. nombres indisponibles.
- ... n'ayant pas lieu de figurer.
- néant ou zéro.
- nombres infimes.
- Ⓟ nombres provisoires.
- Ⓡ nombres rectifiés.

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Total Expenditures

The total expenditures of the Federal Government on scientific activities were almost \$476 million in 1966-67; an increase of 12 per cent over the 1965-66 level. Approximately \$601 million, an increase of 21 per cent over 1966-67, is the estimated total for 1967-68. As shown in the table below, six departments or agencies account for the bulk of these expenditures. However, their share of total expenditures has fallen from about 87 per cent in 1963-64 to about 83 per cent in 1966-67 and a further decrease to 81 per cent is expected in 1967-68, thus indicating growth in scientific activities in departments that have been less active in past years.

Until 1966-67, the Department of National Defence was the largest individual spender—about 20 per cent of the total—but is now superseded by the National Research Council of Canada, whose expenditures account for about 18 per cent of both 1966-67 total expenditures and the 1967-68 estimate. Due to decreases in industrial R & D contracts, National Defence expenditures make up only 17 per cent and 14 per cent of the 1966-67 and 1967-68 totals respectively.

Dépenses totales

L'administration fédérale a dépensé près de 476 millions de dollars au titre de l'activité scientifique en 1966-67, soit 12 p. 100 de plus qu'en 1965-66. On évalue à quelque 601 millions de dollars, c'est-à-dire à 21 p. 100 de plus qu'en 1966-67, le total des dépenses pour 1967-68. Le tableau ci-après indique que six ministères et organismes se partagent le gros de ces dépenses. Toutefois, leur participation aux dépenses totales est passée d'environ 87 p. 100 à quelque 83 p. 100 entre 1963-64 et 1966-67, et on prévoit qu'elle ne sera plus que de 81 p. 100 en 1967-68, ce qui traduit la croissance de l'activité scientifique dans les ministères auparavant peu actifs dans ce domaine.

Jusqu'en 1966-67, c'est le ministère de la Défense nationale qui dépensait le plus (environ 20 p. 100 du total), mais en 1967-68 il a cédé sa place au Conseil national de recherches, dont les dépenses représentent quelque 18 p. 100 des dépenses globales de 1966-67 et des dépenses prévues de 1967-68. Il résulte de la diminution des contrats de recherche et de développement dans l'industrie que les dépenses de la Défense nationale ne constituent que 17 p. 100 et 14 p. 100 respectivement des totaux de 1966-67 et de 1967-68.

Major Sources of Funds for Scientific Activities

Sources principales des fonds affectés à l'activité scientifique

Department or agency — Ministère ou organisme	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
	millions of dollars — millions de dollars				
Agriculture	30.6	33.4	36.8	40.3	48.5
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	45.6	53.1	54.9	62.6	70.4
Energy, Mines and Resources — Énergie, mines et ressources	42.3	43.5	52.9	65.0	84.7
Industry — Industrie	19.0	20.5	24.3	27.2	53.9 ³
National Defence — Défence nationale	69.6	69.9	89.2	81.6	88.3
National Research Council — Conseil national de recherches	46.6	53.8	67.3	89.9	110.8
Transport — Transports	24.0	31.2	32.1	30.5	33.2
All others — Tous autres	41.6	50.8	68.0	78.6	111.7
All departments and agencies — Total — Tous ministères et organismes	319.3	356.2	425.5	475.7	601.5

¹ Revised when necessary.

² Estimates.

³ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants. There is not a real increase in government expenditures of this amount since the IRDIA program replaces the additional allowance of Section 72A of the Income Tax Act.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifique. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

Classes of Scientific Activities

Scientific activities include all activities in the engineering, life and physical sciences concerned with the creation or acquisition of new knowledge or new applications of knowledge to useful purposes. Statistics are collected for five classes of scientific activities: research and development, scientific data collection, scientific information, testing and standardization, and scholarship and fellowship programmes. Data are also collected on capital expenditures on plant for these activities.

The activity of greatest importance is the conduct of research and development, which accounts for about 76 per cent of the total current expenditures over the five years shown. Conduct of R & D, as defined in DBS surveys and reports, includes the performance, administration and planning of research and development. Capital expenditures are the next largest scientific cost, most of them being for the provision of R & D plant and equipment. Capital items used for scientific activities range from research ships to libraries, but would not include space satellites and similar "expendable research equipment" which are included in the current expenditures of R & D. (For further notes on the concept of "expendable research equipment", see Notes on the Survey, page 20.)

Catégories d'activités scientifiques

L'activité scientifique est toute activité dans le domaine du génie, des sciences de la vie et des sciences physiques dont l'objectif est la découverte ou l'acquisition de connaissances nouvelles ou d'applications nouvelles du savoir à des fins utiles. La statistique porte sur cinq catégories d'activité scientifique: la recherche et le développement, la collecte de données scientifiques, l'information scientifique, les tests et la normalisation et les programmes de bourses d'études et de perfectionnement. On recueille aussi des données sur les dépenses en installations afférentes à l'activité scientifique.

L'activité la plus importante est la recherche et le développement, qui entrent pour environ 76 p. 100 des dépenses courantes totales sur la période quinquennale observée. Selon la définition des enquêtes et des rapports du B.F.S., les travaux de R & D englobent l'exécution, l'administration et la planification de la recherche et du développement. Les dépenses en immobilisation sont les deuxièmes en importance dans l'activité scientifique, et la plupart visent des installations et de l'outillage de R & D. Les biens capitaux servant à l'activité scientifique vont des bateaux de recherche aux bibliothèques, mais excluent les satellites et le "matériel consommable de recherche" du même genre, que l'on inclut dans les dépenses courantes de R & D. (Pour plus de précisions sur le "matériel consommable de recherche", voir les Notes relatives à l'enquête, page 20.)

Expenditures by Scientific Activity

Dépenses par activité scientifique

Scientific activity - Activité scientifique	1963 - 64 ¹	1964 - 65 ¹	1965 - 66 ¹	1966 - 67 ¹	1967 - 68 ²
millions of dollars - millions de dollars					
Research and development - Recherche et développement	205.5	228.8	282.3	318.2	411.5
Scientific data collection - Collecte de données scientifiques	41.0	43.5	47.5	53.7	68.6
Scientific information - Information scientifique	13.1	13.1	15.5	18.0	20.7
Testing and standardization - Tests et normalisation	17.5	14.6	18.0	19.3	20.5
Scholarships and fellowships - Bourses d'études et perfectionnement	3.0	3.9	5.2	6.7	9.2
Capital expenditures - Dépenses en immobilisations	39.2	52.3	57.0	59.8	71.0
Total	319.3	356.2	425.5	475.7	601.5

¹ Revised when necessary.

² Estimates.

¹ Chiffres rectifiés au besoin.

² Estimations.

It should be noted that so far as possible, amounts shown for scholarship and fellowship programmes include only those intended to assist the scientific education of the recipients. Grants which may be designated as scholarships or fellowships but which are intended to support the recipient

Il y a lieu de noter que, dans la mesure du possible, les sommes affectées aux bourses d'études et de perfectionnement ne comprennent que les sommes destinées à aider la formation scientifique des bénéficiaires. Les subventions, que l'on peut appeler bourses d'études ou bourses de perfectionnement,

in a research project are considered to be funds for R & D. In 1966-67, expenditures on grants in aid of research and on scholarship and fellowship programmes—a total of approximately \$98 million—show an increase of 50 per cent since 1963-64. It should be noted, however, that grants in aid of research, which formerly consisted largely of grants for research in universities, now include sizeable grants for industrial research. Furthermore, some of the expenditures, though current for the Federal Government, are actually used for the capital programmes of the recipients.

Current costs for scientific data collection are about 11 per cent of the total expenditures on scientific activities. Most of this data collection is carried out by the Department of Energy, Mines and Resources and by the Meteorological Branch of the Department of Transport.

Performers of R & D

Most of the current expenditures of the Federal Government on scientific research and development continue to be spent on work performed in its own establishments. However, an increasing proportion of R & D funds seems to be devoted to support of the performance of extramural R & D. In 1963-64 about 70 per cent of total current R & D funds was allocated to intramural R & D, whereas the proportion expected for 1967-68 is only 58 per cent. The relative shares of both industry and educational institutions have been increasing over this period—that of industry has increased by approximately 17 per cent while the share of educational and non-profit institutions has risen by about 60 per cent. In the past, however, there have been substantial fluctuations in such ratios, particularly in that for industry. The proportion of government funds used to support industrial R & D programmes has varied from 17 per cent in 1963-64 to a high of 23 per cent in 1965-66, followed by a decrease to 18 per cent in 1966-67. In 1967-68 the ratio is expected to increase again to about 21 per cent.

The Federal Government directly finances R & D performed by industry in several ways. One of these is by sponsoring special assistance programmes designed to increase the R & D capability of Canadian industry. At present, there are five continuing programmes of this kind in operation.¹

mais qui ont pour objet d'aider le bénéficiaire dans l'exécution d'un projet de recherche, sont considérées comme des fonds de R & D. En 1966-67, les dépenses en subventions de recherches ainsi qu'en bourses d'études et de perfectionnement (environ 98 millions de dollars au total) marquent une augmentation de 50 p. 100 par rapport à 1963-64. Il faut remarquer, toutefois, que les subventions de recherches, qui consistaient surtout auparavant en subventions de recherches dans les universités, comprennent maintenant des sommes importantes réservées à la recherche industrielle. En outre, certaines dépenses, bien que courantes pour l'administration fédérale, servant en fait aux programmes d'investissements des bénéficiaires.

Le coût de la collecte de données scientifiques représente quelque 11 p. 100 des dépenses totales au titre de l'activité scientifique. La plupart de ces données sont recueillies par le ministère de l'Énergie, des Mines et des Ressources et par la Direction de la météorologie du ministère des Transports.

Exécutants de R & D

Les dépenses courantes du gouvernement fédéral en recherche et développement scientifiques sont encore consacrées pour la plupart aux travaux exécutés dans les établissements de l'administration fédérale. Toutefois, on semble consacrer une part de plus en plus grande des fonds de R & D au soutien de la recherche et du développement *extra-muros*. En 1963-64, on a versé environ 70 p. 100 des fonds globaux de R & D à la recherche et au développement *intra-muros*, mais, prévoit-on, cette proportion ne sera que de 58 p. 100 en 1967-68. La participation relative des établissements industriels et des établissements d'enseignement s'est accrue au cours de cette période: celle de l'industrie a augmenté d'environ 17 p. 100 et celle des établissements d'enseignement et des établissements sans but lucratif, de quelque 60 p. 100. Dans le passé, cependant, ces pourcentages ont subi d'importantes fluctuations, surtout pour ce qui est de l'industrie. La proportion des fonds de l'administration fédérale consacrés au soutien des programmes de R & D industriels est passée de 17 p. 100 en 1963-64 à 23 p. 100 en 1965-66, puis est tombée à 18 p. 100 en 1966-67. En 1967-68, on prévoit que la proportion remontera à environ 21 p. 100.

Le gouvernement fédéral finance directement de plusieurs façons la recherche et le développement dans l'industrie. Il parraine, entre autres, des programmes d'aide spéciale destinés à accroître la capacité de R & D de l'industrie canadienne. Cinq programmes permanents de ce genre sont actuellement en exécution¹.

¹ The description of the first four programmes below is based on the summary contained in a 1965 report by the Advisory Committee on Industrial Research and Technology of the Economic Council of Canada, "A General Incentive Programme to Encourage Research and Development in Canadian Industry", pages 7-8.

¹ La description des quatre premiers programmes ci-dessous est fondée sur le résumé contenu dans le rapport de 1965 du Comité consultatif sur la recherche industrielle et la technologie du Conseil économique du Canada: "Programme général de stimulation des travaux de recherche et de développement dans l'Industrie canadienne", pages 7-8.

Performers of Research and Development **Exécutants de la recherche et du développement**

Performers — Exécutants	1963 - 64 ¹	1964 - 65 ¹	1965 - 66 ¹	1966 - 67 ¹	1967 - 68 ²
	millions of dollars — millions de dollars				
Federal Government — Administration fédérale	146.0	153.0	173.3	201.1	240.4
Canadian industry ³ — Industrie canadienne ³	35.9	45.0	65.6	58.9	84.2 ⁵
Canadian educational and non-profit institutions ³ — Établissements canadiens d'enseignement et sans but lucratif ³	22.2	29.8	41.5	53.2	71.0
Other ^{3,4} — Autres ^{3,4}	1.4	1.0	1.9	5.0	15.9
Total	205.5	228.8	282.3	318.2	411.5

¹ Revised when necessary.

² Estimates.

³ Funds received may be used for capital projects.

⁴ Including provincial governments and foreign recipients.

⁵ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Les fonds reçus peuvent être dépensés en immobilisations.

⁴ Dont les administrations provinciales et les bénéficiaires étrangers.

⁵ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques.

The Defence Development Sharing Programme, introduced in 1959 and funded by the Department of Industry, is the largest programme (almost \$23 million in 1966-67). It is intended to "sustain and improve the development capabilities of Canadian companies active in the military product field", and provides for cost-sharing arrangements between the Department and Canadian firms for selected development projects.

The Department of Industry also administers a Programme for the Advancement of Industrial Technology (PAIT) which was initiated in 1965. Expenditures for 1966-67 amounted to \$4.6 million. The basic purpose of this programme is "to help industry help itself to improve its technological capacity and to expand its innovation activity by underwriting development projects which involve a genuine technical advance and which, if successful, offer good prospects for commercial exploitation". The initiative in proposing projects rests with industry. If a project is successful, the company repays the amount of the Government contribution; if it fails, the grants are written off.

The Defence Industrial Research Programme, administered by the Defence Research Board, also provided \$4.6 million to Canadian industry in 1966-67. Beginning in 1961, this programme was designed to "improve the ability of Canadian companies to compete for research, development, and ultimately production contracts in the United States and NATO defence markets". Preference is given to long-term projects which offer good potential for achieving major advances in performance or techniques.

Le programme d'aide aux travaux de développement pour la défense, établi en 1959 et subventionné par le ministère de l'Industrie, est le plus important (près de 23 millions de dollars en 1966-67). Il a pour objet de "permettre aux sociétés canadiennes productrices de matériel militaire de maintenir ou d'accroître leur capacité de poursuivre des travaux de développement", et il prévoit des ententes sur le partage des frais de certains travaux de développement entre le ministère et les sociétés canadiennes.

Le ministère de l'Industrie a aussi mis sur pied, en 1965, un programme pour l'avancement de la technologie industrielle. Les dépenses en 1966-67 se sont élevées à 4.6 millions de dollars. L'objet fondamental du programme est "d'aider l'industrie à s'aider elle-même en améliorant sa technologie et en poussant ses inventions, et d'appuyer des projets de mise au point de véritables progrès techniques, dont la réussite offrirait de bonnes perspectives commerciales". Les entreprises conservent l'initiative du choix des projets à proposer. Si les travaux sont couronnés de succès, la société rembourse le montant versé par l'État; si c'est un échec, les subventions sont amorties.

Le programme de recherches industrielles pour la défense, administré par le Conseil de recherches pour la défense, a aussi versé à l'industrie canadienne 4.6 millions de dollars en 1966-67. Ce programme, lancé en 1961, a pour objet de "renforcer la position des entreprises canadiennes dans la concurrence pour les contrats de recherche, de développement et, éventuellement de production pour la défense sur les marchés des États-Unis et des pays de l'OTAN". On accorde la préférence aux projets à long terme qui offrent de bonnes perspective de progrès du point de vue des réalisations et des techniques.

The National Research Council's Industrial Research Assistance Programme (IRAP) was initiated early in 1962. In 1966-67 this programme cost a little over \$4 million. IRAP has two objectives: first, "to create new research facilities within industrial companies and to expand existing facilities", and second, "to improve communications between research workers in government and industrial laboratories". The Government, through NRC, pays the direct salaries of approved research programmes undertaken by industry for five years. The company receiving the grant is expected to provide the laboratory space and equipment, the consumable supplies and to pay the overhead expenses. Again, the initiative for submitting projects rests with industry.

It should be noted that in all these programmes both the Government and industry share the project costs. In general, it would seem that the Government pays approximately half the cost of the sponsored projects.

Another recent measure of government-sponsored assistance to industry is the Industrial Research and Development Incentives Act² (IRDIA), which was passed in March, 1967, to "provide general incentives to industry for the expansion of scientific research and development in Canada and to effect certain related amendments to the Income Tax Act". It is applicable to expenditures in fiscal periods ending in 1966 and subsequent years, replacing the income tax deduction of Section 72 A of the Income Tax Act. Sponsored by the Department of Industry and aimed at increasing the overall level of research and development facilities in Canada and including all technical activities essential to the development of new or improved products or processes, the programme provides applicants with tax-exempt grants for their R & D performed in Canada. A cost of \$19.3 million was forecasted for IRDIA for 1967-68. The grants equal 25 per cent of the aggregate of a company's capital expenditures and any increase in current expenditures during the fiscal period over the average of the preceding five fiscal periods. The incentives are available to all taxable Canadian corporations. Instead of receiving a grant, an applicant may elect to receive a credit on account of any income tax which is or may become payable under the Income Tax Act. For the 1966 taxation year, corporations could choose between deducting from their income tax the additional allowance for scientific research provided under Section 72 A of the Income Tax Act or applying for

Le programme d'aide à la recherche industrielle du Conseil national de recherches remonte au début de 1962. En 1966-67, ce programme a coûté un peu plus de 4 millions de dollars. "Il a pour objet, premièrement, la création de nouvelles installations et l'agrandissement des installations existantes de recherches dans les entreprises industrielles et, en second lieu, l'amélioration des communications entre les chercheurs des laboratoires gouvernementaux et ceux des laboratoires industriels". L'administration fédérale, par l'entremise du Conseil national de recherches, verse les traitements directs dans le cadre des programmes approuvés de recherches que les entreprises exécutent pour une période de cinq ans. La société bénéficiaire d'une subvention doit fournir le laboratoire, l'outillage et le matériel consommable et payer les frais généraux. Encore une fois, c'est aux entreprises qu'il incombe de soumettre les projets.

Il importe de noter que dans tous ces programmes, le gouvernement et l'entreprise se partagent le coût des travaux. Il semble qu'en général l'administration fédérale paie environ la moitié du coût des projets qu'il parraine.

L'administration fédérale dispose d'un autre moyen d'aider l'industrie: il s'agit de la Loi stimulant la recherche et le développement scientifiques² adoptée en mars 1967 et "visant à stimuler de façon générale la recherche et le développement scientifiques dans l'industrie canadienne et apportant à la Loi de l'impôt sur le revenu certaines modifications connexes". Elle s'applique aux dépenses des périodes financières terminées en 1966 et dans les années ultérieures et remplace la déduction d'impôt permise à l'article 72 A de la Loi de l'impôt sur le revenu. Il s'agit d'un programme parrainé par le ministère de l'Industrie, qui a pour objet d'accroître l'ensemble des moyens de recherche et de développement au Canada et qui s'étend aux travaux techniques indispensables au développement de méthodes ou de produits nouveaux ou améliorés; il offre des subventions non imposables pour la recherche et le développement exécutés au Canada. On prévoit verser un montant de 19.3 millions de dollars aux termes de ce programme en 1967-68. Les subventions équivalent à 25 p. 100 de l'ensemble des dépenses en immobilisations et de toute augmentation des dépenses courantes de l'exercice par rapport à la moyenne des cinq exercices financiers précédents. Toute société constituée soumise à l'impôt au Canada peut bénéficier des stimulants financiers. Au lieu d'une subvention, une société peut demander un dégrèvement à valoir contre toute somme qu'elle doit ou pourra devoir sous l'empire de la Loi de l'impôt sur le revenu. Pour l'année d'imposition 1966, les sociétés pou-

² This description of IRDIA is based on a booklet, "Industrial Research and Development Incentives Act (IRDIA)" published by the Department of Industry.

² Cette description de la Loi stimulant la recherche et le développement scientifiques est tirée d'une publication du ministère de l'Industrie intitulée: "Loi stimulant la recherche et le développement scientifiques".

a grant under the Industrial Research and Development Incentives Act. In 1967, and thereafter, only the incentive provided by IRDIA is available.

It is expected that increases in the overall level of research and development activities will result in increased ability to meet competition in both domestic and export markets and reduce dependence on imported technology. By allowing corporations to apply for a grant not only with respect to intramural and contract expenditures but also for payments to independent laboratories, industrial research associations and for technical consulting services, it is anticipated that the Act will also encourage the establishment of such institutions and services. It is hoped that the Act will, in a similar manner, foster greater co-operation between industry and universities on research related to industrial problems.

The latest attempt being made by the Federal Government to encourage more effective application of science and technology to Canadian industry is the establishment of four industrial research institutes at Canadian universities. The institutes will be established at McMaster University, the University of Waterloo, the University of Windsor, and the Nova Scotia Technical College. Grants of \$150,000, \$146,000, \$60,000 and \$120,000 respectively have been committed by the Department of Industry to cover overhead expenses over a three-year period. All will be non-profit organizations acting as liaison establishments between industry and the universities, serving industry by applying scientific and engineering methods to problems industry is unable to solve alone and by negotiating grants or contracts between industry and universities to cover particular problems or problem areas. In addition, they will have some training function.

In addition to these special assistance programmes, the Federal Government also provides grants in aid of research to some organizations to be used for laboratory facilities; for example, the Department of Forestry grants to the Pulp and Paper Research Institute of Canada.

Industrial research and development are also aided by contracts for R & D, or for new equipment and materials which require firms to first perform a certain amount of R & D. These contracts are often placed with Canadian firms to encourage them to develop the appropriate facilities and skills needed to enable them to exploit discoveries of government laboratories. For example, in 1966-67,

vaient soit déduire de leur impôt sur leur revenu l'allocation supplémentaire au titre de la recherche scientifique aux termes de l'article 72 A de la Loi de l'impôt sur le revenu, soit demander une subvention en vertu de la Loi stimulant la recherche et le développement scientifiques. A compter de 1967, seul le stimulant prévu par la nouvelle loi est disponibles.

Il est à prévoir que le relèvement du niveau général des travaux de recherche et de développement rendra le Canada plus apte à soutenir la concurrence sur les marchés canadiens et sur les marchés d'exportation, et moins tributaire de la technologie étrangère. Comme la loi autorise les sociétés à faire une demande de subvention à l'égard des dépenses *intra-muros* et des travaux sous-traités à l'extérieur aussi bien qu'à l'égard des paiements aux laboratoires indépendants, aux organismes de recherche industrielle et aux services de consultation technique, on prévoit qu'elle encouragera ainsi l'établissement d'organismes et de services de ce genre. Il est à souhaiter que la loi favorisera, de la même façon, une collaboration plus étroite entre l'industrie et les universités pour ce qui est de la recherche touchant les problèmes de l'industrie.

La dernière mesure gouvernementale pour assurer l'application plus efficace de la science et de la technologie à l'industrie canadienne est l'établissement de quatre instituts de recherche industrielle dans des universités du Canada. Ces instituts seront situés à l'Université McMaster, à l'Université de Waterloo, à l'Université de Windsor, et au *Nova Scotia Technical College*. Le ministère de l'Industrie a affecté des subventions de \$150,000, \$146,000, \$60,000 et \$120,000 pour défrayer ces instituts de leurs frais généraux pour une période de trois ans. Tous seront des organismes sans but lucratif faisant fonction d'établissements de liaison entre l'industrie et les universités; ils rendront service à l'industrie par l'application des méthodes scientifiques et techniques aux problèmes que l'industrie ne peut résoudre seule, et par la négociation de subventions et de contrats entre l'industrie et les universités en vue d'étudier des problèmes particuliers ou des secteurs qui présentent des difficultés. De plus, ils auront à dispenser une certaine formation.

Outre ces programmes d'aide spéciale, le gouvernement fédéral verse à des organismes des subventions de recherche destinées aux installations de laboratoires; par exemple, le ministère des Forêts subventionne l'Institut de recherches sur les pâtes et papiers du Canada.

Le gouvernement aide encore la recherche et le développement dans l'industrie par des contrats de R & D, ou d'installations et de matériel neufs exigeant des entreprises qu'elles réalisent d'abord certains travaux de R & D. Ces contrats sont souvent passés à des entreprises canadiennes en vue d'encourager ces dernières à établir des installations convenables et à acquérir la compétence nécessaire pour profiter

Atomic Energy of Canada Limited and the Department of National Defence paid out over \$22 million through such contracts.

des découvertes des laboratoires du gouvernement. En 1966-67, par exemple, l'Énergie atomique du Canada Limitée et le ministère de la Défense nationale ont déboursé 22 millions de dollars pour des contrats de ce genre.

Industrial R & D Contracts and Grants
Contrats et subventions de R & D industriels

Department or agency — Ministère ou organisme	1958-59 ¹	1959-60 ¹	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66 ²	1966-67 ²	1967-68 ³
	millions of dollars — millions de dollars									
AECL ⁴ — E.A.C.L. ⁴	—	3.1	3.7	5.6	4.5	4.0	4.7	5.5	6.6	6.4
Industry — Industrie	—	1.9	2.9	5.5	8.0	19.0	20.1	21.9	25.8	53.7 ⁵
National Defence — Défense nationale:										
Canadian Forces — Forces canadiennes	45.2	8.6	8.6	7.4	4.4	6.4	10.4	26.9	15.8	12.5
DRB ⁶ — C.R.D. ⁶	2.2	1.3	1.6	2.0	2.6	4.8	6.8	6.3	5.3	5.1
NRC ⁷ — C.N.R. ⁷	—	—	0.1	0.2	0.5	1.6	2.2	3.3	4.2	5.2
Other ⁸ — Autres ⁸	0.1	0.9	0.8	0.3	0.2	0.1	0.8	1.7	1.2	1.2
Total⁹	47.6	15.7	17.6	21.0	20.2	35.9	45.0	65.6	58.9	84.2

¹ Obtained from "Scientific Research and Development", Report No. 23 of the Royal Commission on Government Organization, Ottawa, the Queen's Printer, 1963, Appendix 9.

² Revised when necessary.

³ Estimates.

⁴ Atomic Energy of Canada Limited.

⁵ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants.

⁶ Defence Research Board.

⁷ National Research Council.

⁸ Including Central Mortgage and Housing Corporation, Dominion Coal Board, the Post Office, and the departments of Energy, Mines and Resources, Fisheries, Forestry and Rural Development, and Transport.

⁹ Totals may not add exactly due to rounding.

¹ Tiré de "La recherche scientifique et ses applications", rapport n° 23 de la Commission royale d'enquête sur l'Organisation du gouvernement, Ottawa, Imprimeur de la Reine, 1963, appendice 9.

² Chiffres rectifiés au besoin.

³ Estimations.

⁴ L'Énergie atomique du Canada Limitée.

⁵ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques.

⁶ Conseil de recherches pour la défense.

⁷ Conseil national de recherches.

⁸ Dont la Société centrale d'hypothèques et de logement, l'Office fédéral du charbon, et les ministères des Postes, de l'Énergie, Mines et Ressources, des Pêcheries, des Forêts et Développement rural, et des Transports.

⁹ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Probable Field of Application of Industrial Contracts and Grants

Domaine probable d'application de contrats et de subventions industriels

Field of application — Domaine d'application	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
	millions of dollars — millions de dollars				
Nuclear energy — Énergie nucléaire	4.0	4.7	5.5	6.6	6.4
Space — Espace	0.8	2.2	3.0	3.6	3.0
War and defence — Guerre et défense	29.4	33.9	51.7	40.3	39.9
Other — Autres	1.7	4.2	5.4	8.4	34.9 ³
Total	35.9	45.0	65.6	58.9	84.2

¹ Revised when necessary.

² Estimates.

³ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques.

Federal funds are also disbursed in the form of research grants and contracts to Canadian educational and non-profit institutions. In 1966-67 such assistance amounted to over \$53 million, which is more than twice the 1963-64 figure. A further increase to \$71 million is expected for

Les dépenses fédérales visent aussi des subventions et des contrats de recherches aux établissements canadiens d'enseignement et aux établissements sans but lucratif. En 1966-67, la valeur de cette aide a dépassé 53 millions de dollars, ce qui est plus du double du chiffre de 1963-64, et on compte

1967-68. Two agencies, the National Research Council and the Medical Research Council, distribute over three quarters of all Federal Government funds for direct assistance of research in universities, colleges, hospitals, and voluntary health organizations. The NRC supports research projects in all fields of science, whereas the MRC is involved only in the medical sciences. More than one third of total Government R & D payments to educational and non-profit institutions are for research in the medical sciences. These funds come largely from the MRC and the Department of National Health and Welfare.

Under the Negotiated Development Grants Programme which was set up in 1967, the National Research Council will award Canadian universities special grants to help the latter to develop "centres of excellence" in specific areas of science and technology. This new programme is in addition to NRC's regular support of university research. An amount of \$475,000 is estimated for these new grants in 1967-68.

qu'elle atteindra 71 millions en 1967-68. Deux organismes, le Conseil national de recherches et le Conseil de la recherche médicale, versent plus des trois quarts de tous les fonds fournis par l'administration fédérale à l'appui direct de la recherche dans les universités, collèges, hôpitaux et organismes bénévoles de santé. Le Conseil national de recherches subventionne des travaux de recherches dans tous les domaines scientifiques, tandis que le Conseil de la recherche médicale s'en tient aux sciences médicales. Plus du tiers des contributions financières de l'administration fédérale à la recherche et au développement versées aux établissements d'enseignement et aux établissements sans but lucratif est destiné à la recherche en sciences médicales. Ces fonds proviennent surtout du Conseil de la recherche médicale et du ministère de la Santé nationale et du Bien-être social.

Aux termes du programme de subventions concertées de développement mis sur pied en 1967, le Conseil national de recherches versera aux universités canadiennes des subventions spéciales pour leur aider à établir des "centres d'excellence" dans certains domaines de la science et de la technologie. Ce nouveau programme s'ajoute à l'aide régulière du Conseil national à la recherche dans les universités. On prévoit un montant de \$475,000 pour ces nouvelles subventions en 1967-68.

Federal Government Contracts and Grants for Research in Canadian Educational and Non-profit Institutions
Contrats et subventions de recherche de l'administration fédérale aux établissements canadiens d'enseignement et sans but lucratif

Department or agency — Ministère ou organisme	1958-59 ¹	1959-60 ¹	1960-61	1961-62	1962-63	1963-64	1964-65 ²	1965-66 ²	1966-67 ²	1967-68 ³
millions of dollars — millions de dollars										
AECB ⁴ — C.C.E.A. ⁴	0.4	0.7	0.7	0.7	0.8	0.9	1.3	1.6	2.0	2.5
DRB ⁵ — C.R.D. ⁵	1.4	1.5	1.7	1.7	1.9	1.9	2.3	2.4	2.9	3.7
MRC ⁶ — C.R.M. ⁶	—	—	—	7	3.6	4.5	6.2	11.5 ⁸	11.2	18.5
NHW ⁹ — S.N.B.S. ⁹	2.3	2.9	3.0	3.2	3.4	4.0	4.2	4.3	4.4 ¹⁰	4.4 ¹¹
NRC ¹² — C.N.R. ¹²	6.1	8.3	9.5	11.2	8.4	10.3	14.6	18.1	29.1	37.9
Other ¹³ — Autres ¹³	0.1	0.1	0.4	0.6	0.5	0.6	1.2	3.5	3.6	3.9
Total¹⁴	10.3	13.5	15.3	17.4	18.6	22.2	29.8	41.5	53.2	71.0

¹ Obtained from "Scientific Research and Development", Report No. 23 of the Royal Commission of Government Organization, Ottawa, the Queen's Printer, 1963, Appendices 10 and 11.

² Revised when necessary.

³ Estimated.

⁴ Atomic Energy Control Board.

⁵ Defence Research Board.

⁶ Medical Research Council.

⁷ Included in NRC estimates. Probably between \$2.7 and \$3.0 million.

⁸ Including \$3 millions provided in Supplementary Estimates for 1965-66 but disbursed in 1966-67.

⁹ National Health and Welfare.

¹⁰ In addition, \$2.1 million were provided to the provinces from the Health Resources Fund for research facilities, mainly in educational and non-profit institutions.

¹¹ \$10 million were provided to the provinces from the Health Resources Fund.

¹² National Research Council.

¹³ Including Atlantic Development Board, Atomic Energy of Canada Limited, Central Mortgage and Housing Corporation, Dominion Coal Board, and the departments of Agriculture, Energy, Mines and Resources, Fisheries, Forestry and Rural Development, Indian Affairs and Northern Development, Industry, and Transport.

¹⁴ Totals may not add exactly due to rounding.

¹ Tiré de "La recherche scientifique et ses applications", rapport n° 23 de la Commission royale d'enquête sur l'Organisation du gouvernement Ottawa, Imprimeur de la Reine, 1963, appendices 10 et 11.

² Chiffres rectifiés au besoin.

³ Estimations.

⁴ Commission de contrôle de l'énergie atomique.

⁵ Conseil de recherches pour la défense.

⁶ Conseil de la recherche médicale.

⁷ Compris dans les estimations du C.N.R. Probablement entre \$2,700,000 et \$3,000,000.

⁸ Dont 3 millions de dollars votés dans les budgets supplémentaires de 1965-66 mais dépensés en 1966-67.

⁹ Santé nationale et Bien-être social.

¹⁰ En outre, 2.1 millions de dollars ont été tirés de la Caisse d'aide à la santé et versés aux provinces pour des installations de recherche, surtout dans les établissements d'enseignement et dans les établissements sans but lucratif.

¹¹ Les provinces ont reçu 10 millions de dollars de la Caisse d'aide à la santé.

¹² Conseil national de recherches.

¹³ Dont l'Office d'expansion économique de la région de l'Atlantique, l'Energie atomique du Canada Limitée, la Société centrale d'hypothèques et de logement, l'Office fédéral du charbon, et les ministères de l'Agriculture, de l'Energie, Mines et Ressources, des Pêcheries, des Forêts et Développement rural, des Affaires indiennes et Nord canadien, de l'Industrie, et des Transports.

¹⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Probable Field of Science of Government-sponsored R & D

Domaine scientifique probable de la R & D commandité par l'administration fédérale

Field of science — Domaine scientifique	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
millions of dollars — millions de dollars					
Engineering — Génie	1.9	3.2	5.8	7.8	8.4
Chemistry — Chimie	2.9	3.6	4.4	7.1	9.3
Earth sciences — Sciences de la terre	1.5	2.1	2.4	3.1	4.1
Physics — Physique	2.9	4.2	5.1	7.1	9.1
Agricultural sciences — Sciences agricoles	0.8	1.2	1.5	2.5	3.5
Biological sciences — Sciences biologiques	2.9	3.8	4.5	5.3	7.1
Medical sciences — Sciences médicales	9.1	11.3	16.8 ³	17.4 ⁴	25.1 ⁵
Other — Autres	0.2	0.4	1.0	2.9	4.4
Total	22.2	29.8	41.5	53.2	71.0

¹ Revised when necessary.

² Estimates.

³ Including \$3 provided in Supplementary Estimates for 1965-66 but disbursed in 1966-67.

⁴ In addition, \$2.1 million were provided to the provinces from the Health Resources Fund for research facilities, mainly in educational and non-profit institutions.

⁵ \$10 million were provided to the provinces from the Health Resources Fund.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Dont 3 millions de dollars votés dans les budgets supplémentaires de 1965-66 mais dépensés en 1966-67.

⁴ En outre, 2.1 millions de dollars ont été tirés de la Caisse d'aide à la santé et versés aux provinces pour des installations de recherche, surtout dans les établissements d'enseignement et dans les établissements sans but lucratif.

⁵ Les provinces ont reçu 10 millions de dollars de la Caisse d'aide à la santé.

Field and Category of R & D

In 1966-67 Federal Government intramural expenditures on R & D were divided almost equally among engineering and technology, physical sciences, and life sciences. In the field of engineering and technology, electrical and mechanical engineering together received over 40 per cent of the funds available, while physics accounted for 40 per cent of the expenditures in the physical sciences. The agricultural sciences received about 60 per cent of life sciences funds.

Atomic Energy of Canada Limited, the National Research Council, and the Department of National Defence account for about 87 per cent of the R & D in engineering and technology, AECL being the biggest spender. More than three quarters of the R & D in the physical sciences is performed by the National Research Council and the departments of National Defence and Energy, Mines and Resources. In the life sciences, most of the work is carried out by the departments of Agriculture, Fisheries, and Forestry and Rural Development.

The proportion of the three categories of research and development varies with the orientation of the performers. Thus, the research of the Department of Agriculture is mostly applied, basic research costs account for almost half of the National Research Council's expenditures on R & D, and the Post Office is involved only in development projects. Although estimates of type of R & D

Domaine et catégorie de R & D

En 1966-67, les dépenses *intra-muros* du gouvernement en R & D étaient réparties presque également entre le génie et la technologie, les sciences physiques et les sciences de la vie. Dans le domaine du génie et de la technologie, le génie électrique et le génie mécanique ont reçu ensemble plus de 40 p. 100 des fonds disponibles; en sciences physiques, 40 p. 100 des sommes versées ont été consacrées à la physique. Les sciences agricoles ont obtenu 60 p. 100 des fonds destinés aux sciences de la vie.

L'Énergie atomique du Canada Limitée, le Conseil national de recherches et le ministère de la Défense nationale assurent 87 p. 100 du financement de la R & D en génie et en technologie, l'AECL faisant la contribution la plus considérable. Plus des trois quarts de la recherche et du développement dans les sciences physiques sont exécutés par le Conseil national de recherches et les ministères de la Défense nationale et de l'Énergie, des Mines et des Ressources. Dans les sciences de la vie, la majorité des travaux sont exécutés par les ministères de l'Agriculture, des Pêcheries et des Forêts et du Développement rural.

La proportion des trois genres de recherche et de développement varie selon l'orientation des exécutants. Ainsi, le ministère de l'Agriculture fait surtout de la recherche appliquée, le Conseil national de recherches consacre presque la moitié de ses dépenses de R & D à la recherche fondamentale, et le ministère des Postes ne s'occupe que des projets de développement. Même si les estimations du genre

should be used with caution because of conceptual and survey difficulties, it seems that the Federal Government is mainly involved, intramurally, in applied research. Basic research and development account for approximately 20 per cent and 12 per cent respectively of total intramural expenditures. The NRC and AECL report the largest expenditures for basic research, and AECL and the departments of National Defence and Agriculture for applied research. In development, AECL and the Department of Fisheries have the highest expenditures.

In engineering and technology, applied research accounts for the greatest proportion of R & D costs—nearly 80 per cent in the last two years, and is concentrated largely in AECL, NRC and DND. In the physical sciences, slightly more than 50 per cent of R & D expenditures are used for applied research and about 45 per cent for basic research. The departments with the largest expenditures are the NRC and the Department of Energy, Mines and Resources in basic research, and these two plus DND in applied research. In the life sciences, applied research accounts for about 72 per cent of expenditures. The agricultural sciences, which receive 60 per cent of the total funds spent on R & D in the life sciences, account for two thirds of this applied research.

de R & D sont sujettes à caution en raison des difficultés que suscitent la définition du concept et l'exécution des enquêtes, il semble que l'État s'intéresse surtout, *intra-muros*, à la recherche appliquée. La recherche fondamentale et le développement représentent respectivement environ 20 p. 100 et 12 p. 100 du budget des dépenses *intra-muros*. Ce sont le Conseil national de recherches et l'Énergie atomique du Canada Limitée qui dépensent le plus en recherche fondamentale et l'AECL et les ministères de la Défense nationale et de l'Agriculture, en recherche appliquée. Quant au développement, le premier rang revient à l'AECL et au ministère des Pêcheries.

En génie et en technologie, la recherche appliquée représente la plus forte proportion des frais de R & D (près de 80 p. 100 au cours des deux dernières années) et elle est exécutée surtout par l'AECL, le Conseil national de recherches et le ministère de la Défense nationale. Dans les sciences physiques, un peu plus de 50 p. 100 des dépenses de R & D sont affectées à la recherche appliquée, et environ 45 p. 100 à la recherche fondamentale. Les organismes qui dépensent le plus en recherche fondamentale sont le Conseil national de recherches et le ministère de l'Énergie, des Mines et des Ressources, et, en recherche appliquée, les deux mêmes, plus le ministère de la Défense nationale. Quant aux sciences de la vie, la recherche appliquée représente environ 72 p. 100 des dépenses. Les sciences agricoles, qui reçoivent 60 p. 100 des fonds globaux de R & D destinés aux sciences de la vie, bénéficient des deux tiers de cette recherche appliquée.

Current Intramural R & D Expenditure¹
Dépenses courantes de R & D *intra-muros*¹

Field of science — Domaine scientifique	Category of R & D — Catégorie de R & D							
	1966-67 ²				1967-68 ³			
	Basic research — Recherche fonda- mentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total ⁴	Basic research — Recherche fonda- mentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total ⁴
	millions of dollars — millions de dollars							
Engineering and technology — Génie et technologie	2.5	50.1	11.7	64.3	2.9	65.3	14.5	82.7
Physical sciences — Sciences physiques	31.5	34.5	3.3	69.3	34.0	42.1	3.6	79.8
Life sciences — Sciences de la vie	10.1	48.5	8.3	66.9	11.2	56.0	9.6	76.8
Total	44.0	133.2	23.3	200.5	48.1	163.4	27.8	239.3

¹ Excluding the costs of administering R & D grants and contracts.

² Revised when necessary.

³ Estimates.

⁴ Totals may not add exactly due to rounding.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Chiffres rectifiés au besoin.

³ Estimations.

⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Areas of Investigation

In 1966-67 slightly more than one third of Federal Government current expenditures on applied research and development was directed toward military science. This proportion is expected to

Domaines d'investigation

En 1966-67, le gouvernement fédéral a consacré aux sciences militaires un peu plus d'un tiers de ses dépenses courantes en recherche appliquée et en développement. On prévoit que cette proportion

drop to about 28 per cent for 1967-68. Most of these funds are administered by the departments of Industry and National Defence. DND alone is responsible for approximately 70 per cent of the expenditures.

The area of investigation receiving the second largest amount of financial support is agriculture, fishing and forestry, which accounts for about one fifth of the Government's total current expenditures on applied research and development. Applied research and development in nuclear science account for another 16 per cent of the total expenditures—Atomic Energy of Canada Limited is by far the major performer in this area.

tombera à 28 p. 100 en 1967-68. Les fonds sont gérés pour la plupart par les ministères de l'Industrie et de la Défense nationale. Ce dernier en dépense à lui seul environ 70 p. 100.

Le domaine d'investigation qui reçoit le soutien financier le deuxième en importance est celui de l'agriculture, de la pêche et des forêts, qui entre pour environ un cinquième des dépenses courantes de l'État en recherche appliquée et en développement. Seize pour cent des dépenses totales de recherche appliquée et de développement ont lieu en science nucléaire, et l'Énergie atomique du Canada Limitée est de loin le principal exécutant dans ce domaine.

Areas of Investigation Domaines d'investigation

Area of investigation — Champ d'investigation	Current expenditures for applied research and development — Dépenses courantes en recherche appliquée et développement	
	1966-67 ¹	1967-68 ²
	millions of dollars — millions de dollars	
Nuclear science — Science nucléaire	36.8	47.3
Space travel and communications — Voyages et communications spatiales	5.5	6.6
Military science — Science militaire	78.8	85.3
Agriculture, fishing and forestry — Agriculture, pêche et exploitation forestière	55.3	64.2
Health and hygiene — Santé et hygiène	12.2	22.6
Industry — Industrie	19.4	47.3 ³
Other — Autres	22.0	28.3
Total⁴	229.9	301.6

¹ Revised when necessary.

² Estimates.

³ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants.

⁴ Totals may not add exactly due to rounding.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifique.

⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

Two areas are expected to receive greatly increased support in the future. Research in the field of health will benefit from National Health and Welfare's new grants to the provinces under the Health Resources Fund (since some of the grants cover research facilities). Also, the Department of Industry's new IRDIA programme will increase very considerably the amount of government funds in support of industrial R & D.

On compte que deux secteurs recevront à l'avenir un soutien grandement accru. La recherche en hygiène bénéficiera des nouvelles subventions versées aux provinces par le ministère de la Santé nationale et du Bien-être social en vertu de la loi sur la Caisse d'aide à la santé (vu que certaines de ces subventions s'appliquent aux installations de recherche). De plus, le nouveau programme de stimulants à la recherche et au développement dans l'industrie augmentera considérablement le montant des fonds que l'administration fédérale affecte au soutien de la recherche et du développement dans l'industrie.

Personnel Engaged in R & D

In 1966-67 the equivalent of almost 18,000 Government employees were engaged in R & D—an increase of 9 per cent over 1965-66. The Department of Energy, Mines and Resources shows the greatest rate of increase during this period—about 34 per cent. The Department of Agriculture employs the largest number of personnel engaged in R & D—slightly more than one fifth of the total in 1966-67. Atomic Energy of Canada Limited, the National Research Council, and the departments of Agriculture, National Defence and Energy, Mines and Resources employ about 80 per cent of the scientists and engineers and nearly 85 per cent of the supporting personnel engaged in R & D.

Different types of R & D seem to require different personnel "mixes". For example, AECL employs over four times as many supporting personnel as scientists and engineers, while the NRC, DND and the Department of Agriculture report personnel ratios of 3:1. Other departments have considerably lower proportions of supporting to professional personnel.

Personnel affecté à la R & D

En 1966-67, l'équivalent de près de 18,000 fonctionnaires du gouvernement fédéral se sont adonnés à la recherche et au développement, soit une augmentation de 9 p. 100 par rapport à 1965-66. Le ministère de l'Énergie, des Mines et des Ressources a marqué le taux d'accroissement le plus élevé sur cette période (environ 34 p. 100). Le ministère de l'Agriculture emploie le plus grand nombre d'employés en R & D (un peu plus que le cinquième du total en 1966-67). L'Énergie atomique du Canada Limitée, le Conseil national de recherches, les ministères de l'Agriculture, de la Défense nationale et de l'Énergie, des Mines et des Ressources emploient quelque 80 p. 100 des cadres scientifiques et techniques et près de 85 p. 100 du personnel de soutien de R & D.

Différents genres de R & D semblent nécessiter des "compositions" différentes de travailleurs. L'AECL, par exemple, emploie quatre fois plus de personnel de soutien que de cadres scientifiques et techniques tandis que le Conseil national de recherches et les ministères de la Défense nationale et de l'Agriculture déclarent que ce rapport est de 3/1. Dans les autres ministères, la proportion du personnel de soutien au personnel diplômé est sensiblement plus faible.

Personnel Engaged in R & D¹

Personnel affecté à la R & D¹

Personnel	1965-66 ²	1966-67
	full-time equivalent — en équivalent de plein temps	
Scientists and engineers — Cadres scientifiques et techniques	4,413	4,934
Supporting personnel — Personnel de soutien	11,962	12,840
Total	16,375	17,774

¹ Permanent staff plus seasonal and casual staff.

² Revised when necessary.

¹ Personnel permanent plus le personnel saisonnier et de service intermittent.

² Chiffres rectifiés au besoin.

Approximately 39 per cent of total professional personnel engaged in R & D in 1966-67 were trained in the field of the life sciences, while those trained in the physical sciences and engineering accounted for 37 per cent and 23 per cent respectively of the total number of scientists and engineers.

The departments of Agriculture, Fisheries, Forestry and Rural Development, and National Health and Welfare employ 86 per cent of the professionals trained in the life sciences. Forty-six per cent of the total life scientists are employed by the Department of Agriculture, nearly 22 per cent (biological scientists) work for the departments of Fisheries and Forestry and Rural Development, and another 11 per cent are employed by the Department of National Health and Welfare.

Environ 39 p. 100 de tout le personnel diplômé en R & D en 1966-67 avaient une formation dans le domaine des sciences de la vie; ceux qui avaient une formation en sciences physiques et en génie représentaient respectivement 37 p. 100 et 23 p. 100 des cadres scientifiques et techniques.

Les ministères de l'Agriculture, des Pêcheries, des Forêts et du Développement rural, et de la Santé nationale et du Bien-être social emploient 86 p. 100 des diplômés ayant une formation en sciences de la vie. Quarante-six pour cent d'entre eux sont employés par le ministère de l'Agriculture, près de 22 p. 100 (spécialistes en sciences biologiques) travaillent pour les ministères des Pêcheries et des Forêts et du Développement rural, et 11 p. 100 travaillent au ministère de la Santé nationale et du Bien-être social.

Almost three quarters of the physical scientists engaged in R & D are with the National Research Council and the departments of National Defence and Energy, Mines and Resources. Geologists and other solid earth scientists of the Department of Energy, Mines and Resources account for 16 per cent of the total physical scientists, approximately 20 per cent are physicists with DND and the NRC, and almost 13 per cent are chemists at the NRC.

Atomic Energy of Canada Limited, the National Research Council and the Department of National Defence employ 80 per cent of the engineers and technologists. Twenty-nine per cent were trained in electrical and electronic engineering; most of these work in DND. Nearly 25 per cent of the engineers were trained in mechanical engineering - almost one half of them are with AECL.

Près des trois quarts des spécialistes en sciences physiques qui travaillent en R & D sont au service du Conseil national de recherches, et des ministères de la Défense nationale et de l'Énergie, des Mines et des Ressources. Les géologues et autres spécialistes des sciences de la croûte terrestre au ministère de l'Énergie, des Mines et des Ressources représentent 16 p. 100 de tous les spécialistes en sciences physiques; quelque 20 p. 100 sont des physiciens au services du ministère de la Défense nationale et du Conseil national de recherches, et près de 13 p. 100 sont chimistes au Conseil national de recherches.

L'Énergie atomique du Canada Limitée, le Conseil national de recherches et le ministère de la Défense nationale emploient 80 p. 100 des ingénieurs et des technologistes. Vingt-neuf pour cent ont une formation en génie électrique et en génie électronique; la plupart travaillent au ministère de la Défense nationale. Près de 25 p. 100 des ingénieurs ont une formation en génie mécanique, et presque la moitié d'entre eux sont employés par l'EAEL.

Scientists and Engineers Engaged in R & D,¹ 1966-67
Cadres scientifiques et techniques affectés à la R & D¹, 1966-67

Field of training — Domaine de formation	Bachelors — Bacheliers	Masters — Maîtres	Doctors — Docteurs	Total
	full-time equivalent — en équivalent de plein temps			
Engineering and technology — Génie et technologie	734	284	138	1,156
Physical sciences — Sciences physiques	542	373	902	1,817
Life sciences — Sciences de la vie	404	507	1,011	1,922
Other sciences — Autres sciences	21	8	10	39
Total	1,701	1,172	2,061	4,934

¹ Permanent staff plus seasonal staff.

¹ Personnel permanent plus le personnel saisonnier.

NOTES ON THE SURVEY

1. Total Expenditures

Since scientific activities cut across the classifications used in government records (i.e. "standard objects" such as civil salaries and wages, postage, materials and supplies, etc.), it is generally difficult for the respondents to make accurate estimates. Organizations which are entirely engaged in scientific activities, or which have a division performing all their scientific work, can calculate their scientific costs more readily than others which do not have a clear distinction between their scientific and non-scientific activities. Another general problem is the allocation of "overhead" costs. For example, the Departments of Public Works and Finance, among others, provide services to other departments. Departments or agencies do not require the same degree of support, and, of course, the services provided any organization would normally vary from time to time. Estimates are provided of the more common forms of inter-departmental support, but only at department or agency level. There remains the problem of allocating the correct proportions to scientific activities.

2. Classes of Scientific Activities

It is often difficult to distinguish between certain of the classifications used in these surveys. Research and development, scientific data collection and scientific information are often performed together and by the same people. A given project, if part of a larger research programme, would be classed as R & D; the same project, when outside of a research programme, may be another scientific activity. The officials who can provide the financial data required are not always able to classify the scientific activity.

3. Current and Capital Expenditures

The distinction between current and capital expenditures is sometimes hard to maintain. Much of the equipment used in research is extremely specialized and may have a very short life; large research units may also build some of their own equipment from materials on hand and perhaps with parts from discarded equipment. This has led to the concept of "expendable research equipment" which is used by some departments. To ensure that inter-departmental figures are comparable, adjustments are occasionally required to the capital expenditures reported by other departments. The inclusion of expendable research equipment in current expenditures may lead to fluctuations in costs not connected with variations in the amount of work performed. The allocation of expenditures on multi-purpose plant presents problems similar to those discussed in Section 1.

NOTES RELATIVES À L'ENQUÊTE

1. Dépenses totales

Étant donné que les classements employés dans les dossiers de l'administration (i.e. "objets ordinaires" comme traitements et salaires civils, postes, matériel et fournitures, etc.) ne font pas ressortir l'activité scientifique, il est en général difficile aux répondants de donner des estimations exactes. Les organismes qui se consacrent entièrement à l'activité scientifique ou qui disposent d'une division chargée de tout le travail scientifique peuvent calculer leurs frais scientifiques plus facilement que d'autres qui ne font pas de distinction nette entre leurs initiatives scientifiques et non scientifiques. La répartition des "frais généraux" est un autre problème commun. Par exemple, les ministères des Travaux publics et des Finances, entre autres, rendent des services à d'autres ministères. Ministères et organismes n'exigent pas ces services dans la même mesure et, il va sans dire, les services fournis à un organisme quelconque peuvent, normalement, varier de temps à autre. Les estimations sont fournies quant aux formes ordinaires de service interministériel mais à l'échelon du ministère ou de l'organisme seulement. Il reste le problème de les répartir en proportions exactes à l'activité scientifique.

2. Classes d'activités scientifiques

Il est souvent difficile de distinguer entre certaines des classes employées dans ces enquêtes. La recherche et le développement, la collecte des données scientifiques et l'information scientifique se font souvent en même temps et par les mêmes personnes. S'il fait partie d'un grand programme de recherche, un projet donné serait classé R & D; le même projet, en dehors d'un programme de recherche serait une autre activité scientifique. Les fonctionnaires qui peuvent fournir les données financières requises ne peuvent pas toujours classer l'activité scientifique.

3. Dépenses courantes et dépenses d'investissement

La distinction entre les dépenses courantes et les dépenses en immobilisations est parfois difficile à établir. Une bonne partie de l'équipement employé dans la recherche est extrêmement spécialisé et peut n'avoir qu'une très courte durée; les grands services de recherche peuvent aussi fabriquer une partie de leur équipement avec des matériaux dont ils disposent et peut-être des pièces tirées d'un équipement mis au rancart. Cela amène le concept de "l'équipement de recherche consommable" dont se servent certains ministères. Pour que les chiffres interministériels soient comparables, il faut, à l'occasion, ajuster les chiffres des immobilisations déclarés par d'autres ministères. L'inclusion de l'équipement de recherche consommable dans les dépenses courantes peut entraîner des fluctuations de coûts étrangères aux variations de la somme du travail exécuté. La répartition des dépenses en installations à fins multiples présente des problèmes analogues à ceux qui sont étudiés dans la Section 1.

4. Fields of Research and Development

It is extremely difficult to consistently distinguish between the scientific fields, since a project generally will require work in a number of fields. Furthermore, in a number of cases there is no longer a clear distinction between these fields, for example, "new" areas such as biochemistry, bio-physics and engineering physics are becoming more common. Many projects may also be classified in several ways; for example, a study of a medical problem requiring biological research could be considered as either medical or biological. The individual scientist may be able to classify his work by scientific field, but the person completing the questionnaire, who is generally an administrator, will often have to rely mainly on financial and other files which are readily available. Probably the most common way of allocating expenditures among the fields of science is on the basis of personnel, i.e. assuming that physicists are working only in physics, hence the amount of money spent in that field of research corresponds to the proportion of physicists among R & D personnel.

The exclusion of the social and psychological sciences from the survey has caused additional problems for a number of respondents. This is especially true for those involved in medical research. Research projects requiring anthropological as well as wildlife and botanical studies are also affected by this exclusion.

5. Category of Research and Development

R & D expenditures are also classified as being for basic research, applied research or development. There are a number of problems associated with such a classification. One problem is caused by the variety of definitions which people normally use—definitions which they may continue to use, perhaps only subconsciously, when completing a questionnaire. Even supposing that it were possible to clearly distinguish between the types of research or development, it should be realized that the progress of one project may take it through all three types at least once. A programme of R & D could contain a number of such projects, thus making the analysis quite complicated. Distinguishing between "oriented" basic research and applied research is especially difficult.

6. Personnel Engaged in R & D

For departments or agencies with distinct R & D units, the calculation of total R & D personnel should be relatively straightforward. In other cases the calculation may be quite difficult, since the persons must first be identified

4. Domaines de la recherche et du développement

Il est extrêmement difficile de toujours distinguer entre les domaines scientifiques étant donné qu'en général un projet exigera des travaux dans un certain nombre de domaines. De surcroît, dans un certain nombre de cas, il n'existe plus de distinction nette entre ces domaines; par exemple, les "nouveaux" domaines tels que la biochimie, la biophysique et la physique appliquée, deviennent plus communs. On peut classer aussi plusieurs projets de diverses façons, par exemple, une étude d'un problème médical qui exige des recherches biologiques pourrait être considérée comme projet de recherches médicales ou projet de recherches biologiques. L'investigateur individuel pourra peut-être classer son travail suivant le domaine scientifique mais la personne qui répond au questionnaire, généralement un administrateur, devra souvent s'en remettre surtout à des dossiers financiers et autres, d'accès facile. La façon la plus commune probablement de répartir les dépenses entre les domaines de la science se base sur le personnel, i.e. en supposant que les physiciens ne travaillent que dans la physique et que, conséquemment, la somme d'argent dépensée dans ce domaine de recherche corresponde à la proportion de physiciens parmi les effectifs de R & D.

L'exclusion des sciences sociales et psychologiques de l'enquête a causé des problèmes supplémentaires à un certain nombre de répondants. Il en est particulièrement ainsi de ceux qui sont engagés dans la recherche médicale. Les projets de recherche qui demandent des études anthropologiques aussi bien que fauniques et botaniques sont aussi touchés par cette exclusion.

5. Catégorie de recherche et de développement

Les dépenses de R & D sont aussi classées comme étant pour la recherche fondamentale, la recherche appliquée ou le développement. Il y a un certain nombre de problèmes qui s'associent à un tel classement, dont l'un tient à la variété des définitions normalement employées, définitions que l'on continuera peut-être à employer, inconsciemment, en répondant au questionnaire. Même en supposant qu'il soit possible de distinguer nettement entre les types de recherche et de développement, il faut bien se rendre compte que l'avancement d'un projet peut passer par les trois formes au moins une fois. Un programme de R & D peut contenir un certain nombre de ces projets, ce qui ne peut que compliquer gravement l'étude. Il est particulièrement difficile de distinguer entre la recherche fondamentale "orientée" et la recherche appliquée.

6. Effectif de R & D

Dans le cas des ministères ou organismes disposant de services distincts de R & D, le calcul du personnel total de R & D devrait être assez facile. En d'autres cas, il peut être plutôt difficile, étant donné qu'il faut d'abord identifier les personnes à la

as employed in research and development, and then the proportion of time spent on R & D must be determined. Estimates of the number of persons involved in administrative support of R & D are not yet satisfactory.

7. Continuity and Response

At present it is difficult to establish the historical comparability of the data for the whole period during which statistics have been published. The five year series published in this report is the longest continuous series now available, although it is hoped that revisions can be made to earlier data in order to extend the series to cover the preceding years.

There are several reasons for this unfortunate lack of continuity, some due to the "youth" of the survey and the continuing process of conceptual development, and some due to response problems. For example, it may still be possible to find units which have been overlooked or which were unable, or unwilling, to report scientific activities in the past. Clarification of survey concepts or reconsideration of the nature of a unit's activities can also result in discontinuity because of the inclusion or exclusion of certain expenditures and personnel. In the same way, the addition of individual activities to the survey (e.g. testing and standardization in 1966) will affect the comparability of data from different surveys. As noted earlier in Section 1, the activities, and the way in which they are measured, do not normally correspond to a unit's records. Changes in the record system of respondents may therefore affect the continuity of the data they provide. Because of the subjective nature of the activities measured, and of the guiding criteria, turnover among the officials who complete the questionnaires may also result in marked changes in the data reported to the DBS.

recherche et au développement et, ensuite, déterminer la proportion de temps consacrée à la R & D. Les estimations du nombre de personnes engagées dans les services administratifs auxiliaires de R & D ne sont pas encore satisfaisantes.

7. Continuité et réponse

Il n'est pas facile en ce moment d'établir la comparabilité chronologique des données pour toute la période pour laquelle on a publié des statistiques. La série quinquennale publiée ici est la plus longue série continue qui existe actuellement, mais on espère pouvoir revoir les données antérieures de façon à ce que la série couvre aussi les années précédentes.

Cette déplorable solution de continuité a plusieurs causes, dont la "jeunesse" de l'enquête et l'évolution constante des concepts, ainsi que les problèmes relatifs aux réponses. Par exemple, il est encore possible de trouver des unités qui ont été oubliées, ou qui n'ont pu ou n'ont pas voulu faire état de leur activité scientifique dans le passé. L'explication des concepts de l'enquête ou le réexamen de la nature de l'activité d'une unité peut aussi entraîner une solution de continuité, en raison de l'inclusion ou de l'exclusion de certaines dépenses et de certains employés. De même, l'extension du champ de l'enquête à des activités particulières (e.g. tests et normalisation en 1966) réduira la comparabilité des données des différentes enquêtes. Comme on l'a fait remarquer à la section 1, l'activité, et la façon de la mesurer, ne correspondent pas normalement aux registres d'une unité. Les modifications que les répondants apportent à leurs registres peuvent donc nuire à la continuité des renseignements qu'ils fournissent. Vu la nature subjective de l'activité mesurée et des critères, le renouvellement des fonctionnaires qui remplissent les questionnaires peut donner lieu à des modifications considérables des données déclarées au B.F.S.

STATISTICAL TABLES

TABLEAUX STATISTIQUES

TABLE 1. Total Expenditures of the Federal Government on Scientific Activities, Fiscal Years 1963-64 to 1967-68
TABLEAU 1. Dépenses totales de l'administration fédérale en activités scientifiques, exercices 1963-64 à 1967-68

Department or agency — Ministère ou organisme	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
	millions of dollars — millions de dollars				
Agriculture	30.6	33.4	36.8	40.3	48.5
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	0.1 ³	0.6 ³	2.6 ³
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	0.9	1.2	1.6	2.0	2.5
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	45.6	53.1	54.9	62.6	70.4
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée	0.4	0.1	0.2	0.2	0.1
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	—	—	—	0.1	0.1
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	--	--	0.1	0.1	0.1
Consumer and Corporate Affairs — Consommation et corporation:					
Patent and Copyright Office — Bureau des brevets et du droit d'auteur	2.7	3.1	3.5	3.9	4.7
Dominion Coal Board — Office fédéral du charbon	—	—	--	--	--
Energy, Mines and Resources — Énergie, Mines et Ressources:					
Geographical Branch — Direction de la géographie	0.8	0.9	1.2	1.6	1.7
Geological Survey of Canada — Commission géologique du Canada	8.2	8.9	9.4	11.7	11.5
Inland Waters — Direction des eaux intérieures	3.4	3.9	5.2	6.7	18.1
Marine Sciences — Sciences de la mer	11.2	10.5	13.4	18.5	25.4
Mines	6.8	7.0	8.2	8.2	9.3
Observatories — Observatoires	3.0	3.4	5.8	7.1	6.1
Polar Continental Shelf Project — Étude du plateau continental polaire	1.7	1.8	1.7	2.2	2.0
Surveys and Mapping — Levés et cartographie	7.2	7.1	8.0	9.0	10.4
Sub-totals — Totaux partiels	42.3	43.5	52.9	65.0	84.7
Fisheries — Pêcheries:					
Branches — Directions	2.5	3.0	5.2	7.2	8.6
Fisheries Research Board — Office des recherches sur les pêcheries	7.2	8.0	9.6	12.2	15.6
Sub-totals — Totaux partiels	9.7	10.9	14.8	19.4	24.2
Forestry and Rural Development — Forêts et Développement rural	11.0	13.7	14.9	18.5	24.1
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien:					
Canadian Wildlife Service — Service canadien de la faune	1.2	1.3	2.0	3.2	4.3
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	0.1	0.2	0.3	0.3	0.4
Sub-totals — Totaux partiels	1.3	1.5	2.3	3.5	4.7
Industry — Industrie	19.0	20.5	24.3	27.2	53.9 ⁴
Medical Research Council — Conseil de la recherche médicale	5.2	7.0	12.4	12.5	20.8
National Defence — Défense nationale:					
Canadian Armed Forces — Forces armées canadiennes	31.0	30.7	45.6	36.1	33.6
Defence Research Board — Conseil de recherches pour la défense	38.5	39.2	43.6	45.6	54.8
Sub-totals — Totaux partiels	69.6	69.9	89.2	81.6	88.3
National Energy Board — Office national de l'énergie	—	—	--	--	--
National Health and Welfare — Santé nationale et Bien-être social	8.1	10.5	15.3	14.0 ⁵	23.7 ⁵
National Research Council — Conseil national de recherches	46.6	53.8	67.3	89.9	110.8
Post Office — Postes:					
Engineering Branch — Direction du génie	0.2	0.2	0.2	0.3	0.2
Public Works — Travaux publics:					
Testing Laboratories — Laboratoires d'essais	0.7	0.8	0.8	0.9	1.0
Secretary of State — Secrétariat d'État:					
National Film Board — Office national du film	--	0.1	0.1	0.1	0.1
National Gallery — Galerie nationale	0.1	0.1	0.1	0.1	0.2
National Museum — Musée national	0.7	0.8	0.9	1.5	2.0
Sub-totals — Totaux partiels	0.8	1.0	1.1	1.8	2.3
Trade and Commerce — Commerce:					
Standards Branch — Direction des standards	0.2	0.2	0.2	0.3	0.4
Transport — Transports:					
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	0.1	--	0.1	0.1	0.1
Marine Services — Services de la marine	0.3	0.5	0.6	0.3	1.1
Meteorological Branch — Direction de la météorologie	22.4	24.0	26.1	29.1	30.6
Telecommunications and Electronics — Télécommunications et électronique	1.2	6.6	5.3	1.1	1.3
Sub-totals — Totaux partiels	24.0	31.2	32.1	30.5	33.2
Veterans Affairs — Affaires des anciens combattants	0.4	0.4	0.4	0.4	0.4
All departments and agencies — Total⁶ — Tous ministères et organismes	319.3	356.2	425.5	475.7	601.5

¹ Revised when necessary.

² Estimates.

³ Grants for R & D facilities in the Atlantic Provinces.

⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants. There is not a real increase in government expenditures of this amount since the IRDIA program replaces the additional allowance of Section 72 A of the Income Tax Act.

⁵ Including grants for medical research facilities from the Health Resources Fund.

⁶ Totals may not add exactly due to rounding.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Subventions pour installations de recherche et de développement dans les Provinces Atlantiques.

⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

⁵ Dont les subventions la Caisse d'aide à la santé pour installations de recherches médicales.

⁶ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 2. Current Expenditures¹ of the Federal Government on Scientific Activities, Fiscal Years 1963-64 to 1967-68
TABLEAU 2. Dépenses courantes¹ de l'administration fédérale en activités scientifiques, exercices 1963-64 à 1967-68

Department or agency — Ministère ou organisme	1963-64 ²	1964-65 ²	1965-66 ²	1966-67 ²	1967-68 ³
	millions of dollars — millions de dollars				
Agriculture	26.3	27.4	30.4	34.4	37.6
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	0.1	0.6	2.6
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique.....	0.9	1.2	1.6	2.0	2.5
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	32.1	35.7	40.7	48.7	57.7
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée.....	0.4	0.1	0.2	0.2	0.1
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	—	—	—	—	—
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	—	—	0.1	0.1	0.1
Consumer and Corporate Affairs — Consommation et corporation:					
Patent and Copyright Office — Bureau des brevets et du droit d'auteur.....	2.7	3.1	3.5	3.9	4.7
Dominion Coal Board — Office fédéral du charbon.....	—	—	—	—	—
Energy, Mines and Resources — Énergie, Mines et Ressources:					
Geographical Branch — Direction de la géographie	0.8	0.9	1.2	1.5	1.7
Geological Survey of Canada — Commission géologique du Canada	8.0	8.5	8.6	9.4	10.9
Inland Waters — Direction des eaux intérieures	3.1	3.6	4.6	5.5	13.4
Marine Sciences — Sciences de la mer	8.1	8.4	9.9	11.3	17.7
Mines.....	6.3	6.5	7.4	7.6	8.7
Observatories — Observatoires	2.4	2.6	3.3	3.5	4.3
Polar Continental Shelf Project — Étude du plateau continental polaire	1.6	1.8	1.6	2.2	2.0
Surveys and Mapping — Levés et cartographie	7.2	7.1	8.0	9.0	10.4
Sub-totals — Totaux partiels	37.4	39.4	44.7	50.0	69.0
Fisheries — Pêcheries:					
Branches — Directions	2.0	2.5	3.4	4.6	5.8
Fisheries Research Board — Office des recherches sur les pêcheries.....	6.2	6.8	7.9	9.5	11.7
Sub-totals — Totaux partiels	8.3	9.3	11.2	14.1	17.5
Forestry and Rural Development — Forêts et Développement rural.....	9.2	11.3	13.3	16.1	20.1
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien:					
Canadian Wildlife Service — Service canadien de la faune.....	1.1	1.2	1.6	2.4	3.2
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	0.1	0.2	0.3	0.3	0.4
Sub-totals — Totaux partiels	1.2	1.4	1.9	2.8	3.6
Industry — Industrie	19.0	20.5	24.3	27.2	53.9 ⁴
Medical Research Council — Conseil de la recherche médicale	5.2	7.0	12.4	12.5	20.8
National Defence — Défense nationale:					
Canadian Armed Forces — Forces armées canadiennes	28.5	28.0	45.6	35.3	33.0
Defence Research Board — Conseil de recherches pour la défense	36.3	37.5	41.7	43.7	52.0
Sub-totals — Totaux partiels	64.9	65.4	87.2	79.0	85.0
National Energy Board — Office national de l'énergie	—	—	—	—	—
National Health and Welfare — Santé nationale et Bien-être social	7.2	7.9	8.4	11.4	21.3
National Research Council — Conseil national de recherches.....	42.2	48.9	61.2	82.5	100.5
Post Office — Postes:					
Engineering Branch — Direction du génie	0.2	0.2	0.2	0.3	0.2
Public Works — Travaux publics:					
Testing Laboratories — Laboratoires d'essais.....	0.7	0.7	0.8	0.8	0.9
Secretary of State — Secrétariat d'État:					
National Film Board — Office national du film.....	—	0.1	—	0.1	0.1
National Gallery — Galerie nationale.....	0.1	0.1	0.1	0.1	0.2
National Museum — Musée national	0.7	0.8	0.9	1.5	2.0
Sub-totals — Totaux partiels	0.8	1.0	1.1	1.8	2.3
Trade and Commerce — Commerce:					
Standards Branch — Direction des standards	0.2	0.2	0.2	0.3	0.4
Transport — Transports:					
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	—	—	0.1	0.1	0.1
Marine Services — Services de la marine.....	0.2	0.5	0.6	0.3	1.1
Meteorological Branch — Direction de la météorologie	20.3	21.7	23.6	25.9	27.1
Telecommunications and Electronics — Télécommunications et électronique	0.3	0.3	0.3	0.6	0.9
Sub-totals — Totaux partiels	20.8	22.6	24.6	26.9	29.2
Veterans Affairs — Affaires des anciens combattants.....	0.4	0.4	0.4	0.4	0.4
All departments and agencies — Total⁵ — Tous ministères et organismes	280.2	303.9	368.5	415.9	530.5

¹ Some of the expenditures, though current for the Federal Government, are used for the capital programmes of others, e.g. ADB's grants for Atlantic research facilities, NHW's grants to the provinces for medical research facilities, NRC's university equipment grants.

² Revised when necessary.

³ Estimates.

⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants. There is not a real increase in government expenditures of this amount since the IRDIA program replaces the additional allowance of Section 72 A of the Income Tax Act.

⁵ Totals may not add exactly due to rounding.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements d'autres organismes; par exemple: les subventions de l'Office d'expansion économique de la région de l'Atlantique pour installations de recherche et de développement dans les Provinces Atlantiques, celles du ministère de la Santé nationale et Bien-être social aux provinces pour des installations de recherche médicale et les subventions d'équipement accordés aux universités par le Conseil national de recherches.

² Chiffres rectifiés au besoin.

³ Estimations.

⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

⁵ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 3. Total Expenditures of the Federal Government on Research and Development, Fiscal Years 1963-64 to 1967-68
TABLEAU 3. Dépenses totales de l'administration fédérale en recherche et développement, exercices 1963-64 à 1967-68

Department or agency — Ministère ou organisme	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
	millions of dollars — millions de dollars				
Agriculture	29.6	32.7	36.1	39.4	47.3
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	0.9	1.2	1.6	2.0	2.5
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	45.6	53.0	54.8	62.5	70.3
Energy, Mines and Resources — Énergie, Mines et Ressources:					
Geographical Branch — Direction de la géographie	0.5	0.6	0.8	1.1	1.2
Geological Survey of Canada — Commission géologique du Canada	4.3	4.7	5.7	7.3	6.4
Inland Waters — Direction des eaux intérieures	1.0	0.8	0.6	1.3	3.3
Marine Sciences — Science de la mer	2.3	2.8	4.1	5.8	6.9
Mines	5.4	5.6	6.7	6.5	7.4
Observatories — Observatoires	3.0	3.4	5.8	7.0	6.0
Polar Continental Shelf Project — Étude du plateau continental polaire	0.2	0.1	0.1	0.1	0.1
Surveys and Mapping — Levés et cartographie	—	—	—	0.1	0.2
Sub-totals — Totaux partiels	16.7	18.0	23.8	29.2	31.5
Fisheries — Pêcheries:					
Branches — Directions	2.5	3.0	5.2	7.2	8.6
Fisheries Research Board — Office des recherches sur les pêcheries	7.2	7.9	9.5	12.0	15.4
Sub-totals — Totaux partiel	9.7	10.9	14.7	19.2	24.0
Forestry and Rural Development — Forêts et Développement rural	9.3	10.1	10.9	13.3	17.5
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	0.9	1.1	1.6	2.7	3.9
Industry — Industrie	19.0	20.5	24.3	27.2	53.9 ³
Medical Research Council — Conseil de la recherche médicale	4.6	6.3	11.6	11.4	18.7
National Defence — Défense nationale:					
Canadian Armed Forces — Forces armées canadiennes	12.1	16.1	28.5	17.4	14.5
Defence Research Board — Conseil de recherches pour la défense	38.4	39.0	43.4	45.3	54.5
Sub-totals — Totaux partiels	50.5	55.1	71.9	62.8	69.0
National Health and Welfare — Santé nationale et Bien-être social	6.9	9.1	13.7	12.0	20.9
National Research Council — Conseil national de recherches	41.2	47.9	59.1	79.4	98.3
Transport — Transports:					
Meteorological Branch — Direction de la météorologie	1.6	1.7	2.5	2.9	3.6
Other branches — Autres directions	1.5	7.1	6.0	1.4	2.4
Sub-totals — Totaux partiels	3.1	8.8	8.5	4.3	6.0
Other — Autres	1.9	2.0	2.0	2.8	5.2
All departments and agencies — Total⁴ — Tous ministères et organismes	239.8	276.7	334.6	368.2	469.0

¹ Revised when necessary.

² Estimates.

³ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants. There is not a real increase in government expenditures of this amount since the IRDIA program replaces the additional allowance of Section 72 A of the Income Tax Act.

⁴ Totals may not add exactly due to rounding.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et la développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

⁴ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 4. Current Expenditures¹ of the Federal Government on Research and Development, Fiscal years 1963-64 to 1967-68
TABEAU 4. Dépenses courantes¹ de l'administration fédérale en recherche et développement, exercices 1963-64 to 1967-68

Department or agency — Ministère ou organisme	1963-64 ²	1964-65 ²	1965-66 ²	1966-67 ²	1967-68 ³
	millions of dollars — millions de dollars				
Agriculture	25.4	26.7	29.6	33.5	36.4
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	0.9	1.2	1.6	2.0	2.5
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	32.1	35.7	40.6	48.5	57.7
Energy, Mines and Resources — Énergie, Mines et Ressources:					
Geographical Branch — Direction de la géographie	0.5	0.6	0.8	1.0	1.2
Geological Survey of Canada — Commission géologique du Canada	4.0	4.3	4.9	5.0	5.7
Inland Waters — Direction des eaux intérieures	1.0	0.8	0.6	1.3	3.3
Marine Sciences — Sciences de la mer	1.8	2.5	2.9	4.0	4.8
Mines	4.9	5.1	5.9	6.0	6.8
Observatories — Observatoires	2.4	2.5	3.3	3.4	4.2
Polar Continental Shelf Project — Étude du plateau continental polaire	0.2	0.1	0.1	0.1	0.1
Surveys and Mapping — Levés et cartographie	—	—	—	0.1	0.2
Sub-totals — Totaux partiels	14.8	16.0	18.4	20.9	26.3
Fisheries — Pêcheries:					
Branches — Directions	2.0	2.5	3.4	4.6	5.8
Fisheries Research Board — Office des recherches sur les pêcheries	6.2	6.8	7.7	9.3	11.5
Sub-totals — Totaux partiels	8.3	9.3	11.1	13.9	17.3
Forestry and Rural Development — Forêts et Développement rural	7.4	7.7	9.3	10.9	13.5
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	0.9	0.9	1.2	1.9	2.8
Industry — Industrie	19.0	20.5	24.3	27.2	53.9 ⁴
Medical Research Council — Conseil de la recherche médicale	4.6	6.3	11.6	11.4	18.7
National Defence — Défense nationale:					
Canadian Armed Forces — Forces armées canadiennes	9.6	13.6	28.5	17.4	14.5
Defence Research Board — Conseil de recherches pour la défense	36.2	37.3	41.5	43.5	51.8
Sub-totals — Totaux partiels	45.8	50.9	69.9	60.9	66.3
National Health and Welfare — Santé nationale et Bien-être social	6.1	6.5	6.8	9.4	18.6
National Research Council — Conseil national de recherches	36.8	43.1	53.0	72.0	88.1
Transport — Transports:					
Meteorological Branch — Direction de la météorologie	1.2	1.5	1.8	1.9	2.5
Other branches — Autres directions	0.5	0.9	1.0	0.9	2.0
Sub-totals — Totaux partiels	1.8	2.3	2.8	2.8	4.5
Other — Autres	1.6	1.7	2.1	2.9	4.8
All departments and agencies — Total⁵ — Tous ministères et organismes	205.5	228.8	282.3	318.2	411.5

¹ Some of these expenditures, although current for the Federal Government, are used for the capital programmes of the recipients.

² Revised when necessary.

³ Estimates.

⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants. There is not a real increase in government expenditures of this amount since the IRDIA program replaces the additional allowance of Section 72 A of the Income Tax Act.

⁵ Totals may not add exactly due to rounding.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements des bénéficiaires.

² Chiffres rectifiés au besoin.

³ Estimations.

⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

⁵ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 5. Current Intramural Expenditures of the Federal Government on Research and Development, Fiscal Years 1963-64 to 1967-68

TABLÉAU 5. Dépenses courantes intra-muros de l'administration fédérale en recherche et développement, exercices 1963-64 à 1967-68

Department or agency — Ministère ou organisme	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
millions of dollars — millions de dollars					
Agriculture	25.2	26.6	29.5	33.0	35.8
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	28.0	30.8	34.9	41.5	50.5
Energy, Mines and Resources — Énergie, Mines et Ressources:					
Geographical Branch — Direction de la géographie	0.5	0.6	0.8	1.0	1.1
Geological Survey of Canada — Commission géologique du Canada	3.9	4.2	4.8	4.8	5.6
Inland Waters — Direction des eaux intérieures	1.0	0.8	0.6	1.2	3.1
Marine Sciences — Sciences de la mer	1.8	2.5	2.9	4.0	4.8
Mines	4.9	5.1	5.8	5.9	6.7
Observatories — Observatoires	2.4	2.5	3.3	3.4	4.1
Polar Continental Shelf Project — Étude du plateau continental polaire	0.1	0.1	0.1	--	0.1
Surveys and Mapping — Levés et cartographie	--	--	--	0.1	0.2
Sub-totals — Totaux partiels	14.7	15.8	18.2	20.6	25.6
Fisheries — Pêcheries:					
Branches — Directions	2.0	2.3	2.8	3.9	4.6
Fisheries Research Board — Office des recherches sur les pêcheries	6.2	6.8	7.7	9.1	11.1
Sub-totals — Totaux partiels	8.1	9.0	10.5	13.0	15.7
Forestry and Rural Development — Forêts et Développement rural	7.4	7.0	7.8	10.1	12.9
Indian Affairs and Northern Development — Affaires indiennes et Nord Canadien	0.7	0.7	0.9	1.5	2.3
National Defence — Défense nationale	32.2	31.4	34.3	36.8	44.4
National Health and Welfare — Santé nationale et Bien-être social	1.8	2.0	2.2	2.6	3.8
National Research Council — Conseil national de recherches	24.6	25.9	30.8	37.7	43.6
Transport — Transports:					
Meteorological Branch — Direction de la météorologie	1.1	1.3	1.7	1.7	2.2
Other branches — Autres directions	0.5	0.7	0.8	0.5	1.1
Sub-totals — Totaux partiels	1.6	2.1	2.4	2.2	3.3
Other — Autres	1.8	1.7	1.8	2.1	2.4
All departments and agencies — Total ³ — Tous ministères et organismes	146.0	153.0	173.3	201.1	240.3

¹ Revised when necessary.

² Estimates.

³ Totals may not add exactly due to rounding.

¹ Chiffres rectifiés au besoin.

² Estimations.

³ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 6. Capital Expenditures of the Federal Government on Research and Development Facilities, Fiscal Years 1963-64 to 1967-68

TABLÉAU 6. Dépenses de l'administration fédérale en installations de recherche et de développement, exercices 1963-64 à 1967-68

Department or agency — Ministère ou organisme	1963-64 ¹	1964-65 ¹	1965-66 ¹	1966-67 ¹	1967-68 ²
millions of dollars — millions de dollars					
Agriculture	4.2	6.0	6.4	5.9	10.9
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	13.5	17.3	14.3	13.9	12.6
Energy, Mines and Resources — Énergie, Mines et Ressources	1.9	2.0	5.3	8.3	5.3
Fisheries — Pêcheries	1.5	1.6	3.4	5.3	6.7
Forestry and Rural Development — Forêts et Développement rural	1.9	2.4	1.6	2.3	4.0
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	0.1	0.2	0.4	0.8	1.1
National Defence — Défense nationale	4.7	4.2	2.0	1.9	2.8
National Health and Welfare — Santé nationale et Bien-être social	0.8	2.6	6.9	2.6	2.3
National Research Council — Conseil national de recherches	4.3	4.8	6.1	7.4	10.2
Transport — Transports	1.4	6.5	5.7	1.5	1.6
Other — Autres	--	0.2	0.1	0.1	0.1
All departments and agencies — Total — Tous ministères et organismes	34.3	47.8	52.2	50.0	57.6

¹ Revised when necessary.

² Estimates.

¹ Chiffres rectifiés au besoin.

² Estimations.

TABLE 7. Current Expenditures¹ of the Federal Government on Scientific Activities by Activity, Fiscal Year 1966-67²
TABLEAU 7. Dépenses courantes¹ de l'administration fédérale en activités scientifiques, par activité, exercice 1966-67²

Department or agency — Ministère ou organisme	R & D	Scientific data collection — Collecte de données scientifiques	Scientific information — Information scientifique	Testing and standardization — Tests et normalisation	Scholarships and fellowships ³ — Bourses d'études et perfectionnement ³	Total
thousands of dollars — milliers de dollars						
Agriculture	33,463	10	971	—	—	34,444
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	634	—	—	—	—	634
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	2,000	—	—	—	—	2,000
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	48,550	—	—	—	132	48,682
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée	166	—	—	6	—	172
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	—	—	—	8	—	8
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	80	—	—	—	—	80
Consumer and Corporate Affairs — Consommation et corporation: Patent and Copyright Office — Bureau des brevets et du droit d'auteur	—	—	3,927	—	—	3,927
Dominion Coal Board — Office fédéral du charbon	14	—	—	—	—	14
Energy, Mines and Resources — Énergie, Mines et Ressources: Geographical Branch — Direction de la géographie	1,040	313	164	—	—	1,517
Geological Survey of Canada — Commission géologique du Canada	4,987	3,732	658	—	—	9,377
Inland Waters — Direction des eaux intérieures	1,280	3,742	486	—	—	5,508
Marine Sciences — Sciences de la mer	4,050	7,206	87	—	—	11,343
Mines	5,997	625	1,010	—	—	7,632
Observatories — Observatoires	3,428	—	85	—	—	3,513
Polar Continental Shelf Project — Étude du plateau continental polaire	53	2,091	5	—	—	2,149
Surveys and Mapping — Levés et cartographie	115	4,981	3,899	—	—	8,995
Sub-totals — Totaux partiels	20,950	22,690	6,394	—	—	50,034
Fisheries — Pêcheries: Branches — Directions	4,585	—	—	—	—	4,585
Fisheries Research Board — Office des recherches sur les pêcheries	9,349	—	150	—	9	9,508
Sub-totals — Totaux partiels	13,934	—	150	—	9	14,093
Forestry and Rural Development — Forêts et Développement rural	10,938	4,593	612	—	—	16,143
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien: Canadian Wildlife Service — Service canadien de la faune	1,582	627	214	—	12	2,435
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	332	—	—	—	—	332
Sub-totals — Totaux partiels	1,904	627	214	—	12	2,757
Industry — Industrie	27,224	—	—	—	—	27,224
Medical Research Council — Conseil de la recherche médicale	11,370	115	31	—	1,022	12,538
National Defence — Défense nationale: Canadian Armed Forces — Force armées canadiennes	17,449	1,312	811	15,730	—	35,302
Defence Research Board — Conseil de recherches pour la défense	43,451	—	116	—	114	43,681
Sub-totals — Totaux partiels	60,900	1,312	927	15,730	114	78,983
National Energy Board — Office national de l'énergie	—	—	—	1	—	1
National Health and Welfare — Santé nationale et Bien-être social	9,396	908	121	600	354	11,379
National Research Council — Conseil national de recherches	72,026	248	4,155	1,740	4,306	82,475
Post Office — Postes: Engineering Branch — Direction du génie	257	—	4	3	—	264
Public Works — Travaux publics: Testing Laboratories — Laboratoires d'essais	415	—	—	383	—	798
Secretary of State — Secrétariat d'État: National Film Board — Office national du film	83	—	—	—	—	83
National Gallery — Galerie nationale	111	3	3	—	—	117
National Museum — Musée national	551	601	361	—	—	1,513
Sub-totals — Totaux partiels	745	604	364	—	—	1,713
Trade and Commerce — Commerce: Standards Branch — Direction des standards	—	—	—	277	—	277
Transport — Transports: Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	30	5	—	39	—	74
Marine Services — Services de la marine	252	—	—	—	—	252
Meteorological Branch — Direction de la météorologie	1,936	22,632	79	522	770	25,939
Telecommunications and Electronics — Télécommunications et électronique	575	—	20	—	—	595
Sub-totals — Totaux partiels	2,793	22,637	99	561	770	26,860
Veterans Affairs — Affaires des anciens combattants	428	—	—	—	—	428
All departments and agencies — Total — Tous ministères et organismes	318,187	53,744	17,969	19,309	6,719	415,928

¹ Some of these expenditures, although current for the Federal Government, are used for the capital programmes of the recipients.

² Revised when necessary.

³ The value of scholarships and fellowships intended to support research is included in R & D expenditures.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements des bénéficiaires.

² Chiffres rectifiés au besoin.

³ La valeur des bourses d'études et perfectionnement destinées à la recherche est incluse dans les dépenses de recherche et de développement.

TABLE 8. Current Expenditures¹ of the Federal Government on Scientific Activities, by Activity, Fiscal Year 1967-68²
TABLEAU 8. Dépenses courantes¹ de l'administration fédérale en activités scientifiques, par activité, exercice 1967-68²

Department or agency — Ministère ou organisme	R & D	Scientific data collection Collecte de données scientifiques	Scientific information Information scientifique	Testing and standardization Tests et normalisation	Scholarships and fellowships ³ Bourses d'études et perfectionnement ³	Total
thousands of dollars — milliers de dollars						
Agriculture	36,444	11	1,158	—	—	37,613
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	2,575	—	—	—	—	2,575
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	2,500	—	—	—	—	2,500
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	57,673	—	—	—	85	57,758
Canadian Arsenal Limited — Les Arsenaux canadiens Limitée	116	—	—	18	—	134
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	—	—	—	43	—	43
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	70	—	—	—	—	70
Consumer and Corporate Affairs — Consommation et corporation: Patent and Copyright Office — Bureau des brevets et du droit d'auteur	—	—	4,658	—	—	4,658
Dominion Coal Board — Office fédéral du charbon	24	—	—	—	—	24
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	1,169	350	184	—	—	1,703
Geological Survey of Canada — Commission géologique du Canada	5,746	4,447	710	—	—	10,903
Inland Waters — Direction des eaux intérieures	3,339	8,875	1,177	—	—	13,391
Marine Sciences — Sciences de la mer	4,783	12,780	169	—	—	17,732
Mines	6,811	710	1,151	—	—	8,672
Observatories — Observatoires	4,175	—	93	—	—	4,268
Polar Continental Shelf Project — Étude du plateau continental polaire	69	1,921	5	—	—	1,995
Surveys and Mapping — Levés et cartographie	176	6,075	4,117	—	—	10,368
Sub-totals — Totaux partiels	26,268	35,158	7,606	—	—	69,032
Fisheries — Pêcheries:						
Branches — Directions	5,801	—	—	—	—	5,801
Fisheries Research Board — Office des recherches sur les pêcheries	11,548	—	175	—	10	11,733
Sub-totals — Totaux partiels	17,349	—	175	—	10	17,534
Forestry and Rural Development — Forêts et Développement rural	13,453	5,851	780	—	—	20,084
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien:						
Canadian Wildlife Service — Service canadien de la faune	2,408	615	200	—	20	3,243
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	364	—	—	—	—	364
Sub-totals — Totaux partiels	2,772	615	200	—	20	3,607
Industry — Industrie	53,865 ⁴	—	31	—	—	53,896 ⁴
Medical Research Council — Conseil de la recherche médicale	18,729	135	101	—	1,797	20,762
National Defence — Défense nationale:						
Canadian Armed Forces — Forces armées canadiennes	14,514	1,255	797	16,387	—	32,953
Defence Research Board — Conseil de recherches pour la défense	51,758	—	140	—	138	52,036
Sub-totals — Totaux partiels	66,272	1,255	937	16,387	138	84,989
National Energy Board — Office national de l'énergie	—	—	—	1	—	1
National Health and Welfare — Santé nationale et Bien-être social	18,603	1,141	137	1,073	386	21,340
National Research Council — Conseil national de recherches	88,096	275	4,421	1,949	5,788	100,529
Post Office — Postes:						
Engineering Branch — Direction du génie	236	—	5	5	—	246
Public Works — Travaux publics:						
Testing Laboratories — Laboratoires d'essais	473	—	—	425	—	898
Secretary of State — Secrétariat d'État:						
National Film Board — Office national du film	104	—	—	—	—	104
National Gallery — Galerie nationale	158	6	3	—	7	174
National Museum — Musée national	771	762	457	—	—	1,990
Sub-totals — Totaux partiels	1,033	768	460	—	7	2,268
Trade and Commerce — Commerce:						
Standards Branch — Direction des standards	—	—	—	355	—	355
Transport — Transports:						
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	43	7	—	20	—	70
Marine Services — Services de la marine	1,145	—	—	—	—	1,145
Meteorological Branch — Direction de la météorologie	2,453	23,381	73	281	949	27,137
Telecommunications and Electronics — Télécommunications et électronique	846	—	22	—	—	868
Sub-totals — Totaux partiels	4,487	23,388	95	301	949	29,220
Veterans Affairs — Affaires des anciens combattants	415	—	—	—	—	415
All departments and agencies — Total — Tous ministères et organismes	411,453	68,597	20,764	20,557	9,180	530,551

¹ Some of these expenditures, although current for the Federal Government, are used for the capital programmes of the recipients.

² Estimates.

³ The value of scholarships and fellowships intended to support research is included in R & D expenditures.

⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDA) grants. There is not a real increase in government expenditures of this amount since the IRDA program replaces the additional allowance of Section 72 A of the Income Tax Act.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements des bénéficiaires.

² Estimations.

³ La valeur des bourses d'études et perfectionnement destinées à la recherche est incluse dans les dépenses de recherche et de développement.

⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

TABLE 9. Current Expenditures of the Federal Government on Scientific Activities, by Performer, Fiscal Year 1966-67¹
TABLEAU 9. Dépenses courantes de l'administration fédérale en activités scientifiques, par exécutant, exercice 1966-67¹

Department or agency — Ministère ou organisme	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ² — Établissements canadiens d'enseignement et sans but lucratif ²	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign ⁴ — Exécutants à l'étranger ⁴	Total
	thousands of dollars — milliers de dollars					
Agriculture	34,001	—	431	12	—	34,444
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	—	634	—	634
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	2,000	—	—	2,000
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	1,456	6,551	529	16	130	48,682
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée	172	—	—	—	—	172
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	8	—	—	—	—	8
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	27	17	2	34	—	80
Consumer and Corporate Affairs — Consommation et corporation: Patent and Copyright Office — Bureau des brevets et du droit d'auteur	3,927	—	—	—	—	3,927
Dominion Coal Board — Office fédéral du charbon	—	6	3	5	—	14
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	1,492	—	25	—	—	1,517
Geological Survey of Canada — Commission géologique du Canada	7,404	1,824	149	—	—	9,377
Inland Waters — Direction des eaux intérieures	5,470	—	38	—	—	5,508
Marine Sciences — Sciences de la mer	11,343	—	—	—	—	11,343
Mines	7,532	—	100	—	—	7,632
Observatories — Observatoires	3,482	—	31	—	—	3,513
Polar Continental Shelf Project — Étude du plateau continental polaire	2,141	8	—	—	—	2,149
Surveys and Mapping — Levés et cartographie	8,982	—	13	—	—	8,995
Sub-totals — Totaux partiels	47,846	1,832	356	—	—	50,034
Fisheries — Pêcheries:						
Branches — Directions	3,912	27	19	627	—	4,585
Fisheries Research Board — Office des recherches sur les pêcheries	9,249	—	259	—	—	9,508
Sub-totals — Totaux partiels	13,161	27	278	627	—	14,093
Forestry and Rural Development — Forêts et Développement rural	15,310	749	84	—	—	16,143
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien						
Canadian Wildlife Service — Service canadien de la faune	2,336	—	99	—	—	2,435
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	—	—	322	—	—	322
Sub-totals — Totaux partiels	2,336	—	421	—	—	2,757
Industry — Industrie	—	25,781	1,443	—	—	27,224
Medical Research Council — Conseil de la recherche médicale	188	16	12,056 ⁵	6	272	12,538 ⁵
National Defence — Défense nationale:						
Canadian Armed Forces — Forces armées canadiennes	18,584	16,610	—	—	108	35,302
Defence Research Board — Conseil de recherches pour la défense	35,388	5,281	2,979	33	—	43,681
Sub-totals — Totaux partiels	53,972	21,891	2,979	33	108	78,983
National Energy Board — Office national de l'énergie	1	—	—	—	—	1
National Health and Welfare — Santé nationale et Bien-être social	4,276	—	4,776	2,327	—	11,379
National Research Council — Conseil national de recherches	42,856	4,447	33,307	686	1,179	82,475
Post Office — Postes:						
Engineering Branch — Direction du génie	256	8	—	—	—	264
Public Works — Travaux publics:						
Testing Laboratories — Laboratoires d'essais	798	—	—	—	—	798
Secretary of State — Secrétariat d'État:						
National Film Board — Office national du film	83	—	—	—	—	83
National Gallery — Galerie nationale	117	—	—	—	—	117
National Museum — Musée national	1,438	—	—	75	—	1,513
Sub-totals — Totaux partiels	1,638	—	—	75	—	1,713
Trade and Commerce — Commerce:						
Standard Branch — Direction des standards	277	—	—	—	—	277
Transport — Transports:						
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	74	—	—	—	—	74
Marine Services — Services de la marine	167	85	—	—	—	252
Meteorological Branch — Direction de la météorologie	25,281	397	187	10	64	25,939
Telecommunications and Electronics — Télécommunications et électronique	305	290	—	—	—	595
Sub-totals — Totaux partiels	25,827	772	187	10	64	26,860
Veterans Affairs — Affaires des anciens combattants	428	—	—	—	—	428
All departments and agencies — Total — Tous ministères et organismes	288,761	62,097	58,852	4,465	1,753	415,928

¹ Revised when necessary.² Funds received may be used for capital projects.³ Mainly provincial governments.⁴ Mainly scholarships and fellowships abroad.⁵ \$3 million voted in 1965-66 Supplementary Estimates was also spent in 1966-67.¹ Chiffres rectifiés au besoin.² Les fonds reçus peuvent être dépensés en immobilisations.³ Surtout les administrations provinciales.⁴ Surtout les bourses d'études et perfectionnement et à l'étranger.⁵ En outre, une somme de 3 millions de dollars comprise dans les budgets supplémentaires de 1965-66 a été dépensée en 1966-67.

TABLE 10. Current Expenditures of the Federal Government on Scientific Activities, by Performer, Fiscal Year 1967-68¹TABLEAU 10. Dépenses courantes de l'administration fédérale en activités scientifiques, par exécutant, exercice 1967-68¹

Department or agency — Ministère ou organisme	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ² — Établissements canadiens d'enseignement et sans but lucratif ²	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign ⁴ — Exécutants à l'étranger ⁴	Total
thousands of dollars — milliers de dollars						
Agriculture	36,988	—	613	12	—	37,613
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	500	2,075	—	2,575
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	2,500	—	—	2,500
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	50,529	6,439	580	110	100	57,758
Canadian Arsenal Limited — Les Arsenaux canadiens Limitée	134	—	—	—	—	134
Canadian Government Printing Bureau — Imprimerie du gouvernement canadien	43	—	—	—	—	43
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	23	19	1	27	—	70
Consumer and Corporate Affairs — Consommation et corporation: Patent and Copyright Office — Bureau des brevets et du droit d'auteur	4,658	—	—	—	—	4,658
Dominion Coal Board — Office fédéral du charbon	—	4	3	17	—	24
Energy, Mines and Resources — Énergie, Mines et Ressources: Geographical Branch — Direction de la géographie	1,668	—	35	—	—	1,703
Geological Survey of Canada — Commission géologique du Canada	8,780	1,938	185	—	—	10,903
Inland Waters — Direction des eaux intérieures	13,141	—	250	—	—	13,391
Marine Sciences — Sciences de la mer	17,732	—	—	—	—	17,732
Mines	8,572	—	100	—	—	8,672
Observatories — Observatoires	4,219	—	49	—	—	4,268
Polar Continental Shelf Project — Étude du plateau continental polaire	1,995	—	—	—	—	1,995
Surveys and Mapping — Levés et cartographie	10,347	—	21	—	—	10,368
Sub-totals — Totaux partiels	66,454	1,938	640	—	—	69,032
Fisheries — Pêcheries: Branches — Directions	4,558	45	21	1,177	—	5,801
Fisheries Research Board — Office des recherches sur les pêcheries	11,323	—	410	—	—	11,733
Sub-totals — Totaux partiels	15,881	45	431	1,177	—	17,534
Forestry and Rural Development — Forêts et Développement rural	19,504	250	330	—	—	20,084
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien: Canadian Wildlife Service — Service canadien de la faune	3,069	—	174	—	—	3,243
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	—	—	364	—	—	364
Sub-totals — Totaux partiels	3,069	—	538	—	—	3,607
Industry — Industrie	—	53,753 ⁵	123	—	20	53,896 ⁵
Medical Research Council — Conseil de la recherche médicale	262	3	20,060	9	428	20,762
National Defence — Défense nationale: Canadian Armed Forces — Forces armées canadiennes	19,116	13,341	—	—	496	32,953
Defence Research Board — Conseil de recherches pour la défense	43,045	5,069	3,854	68	—	52,036
Sub-totals — Totaux partiels	62,161	18,410	3,854	68	496	84,989
National Energy Board — Office national de l'énergie	1	—	—	—	—	1
National Health and Welfare — Santé nationale et Bien-être social	6,196	—	4,815	10,329	—	21,340
National Research Council — Conseil national de recherches	49,083	5,475	43,516	743	1,712	100,529
Post Office — Postes: Engineering Branch — Direction du génie	239	7	—	—	—	246
Public Works — Travaux publics: Testing Laboratories — Laboratoires d'essais	886	—	12	—	—	898
Secretary of State — Secrétariat d'État: National Film Board — Office national du film	104	—	—	—	—	104
National Gallery — Galerie nationale	174	—	—	—	—	174
National Museum — Musée national	1,910	—	—	80	—	1,990
Sub-totals — Totaux partiels	2,188	—	—	80	—	2,268
Trade and Commerce — Commerce: Standards Branch — Direction des standards	355	—	—	—	—	355
Transport — Transports: Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	70	—	—	—	—	70
Marine Services — Services de la marine	530	615	—	—	—	1,145
Meteorological Branch — Direction de la météorologie	26,381	398	284	10	64	27,137
Telecommunications and Electronics — Télécommunications et électronique	576	292	—	—	—	868
Sub-totals — Totaux partiels	27,557	1,305	284	10	64	29,220
Veterans Affairs — Affaires des anciens combattants	415	—	—	—	—	415
All departments and agencies — Total — Tous ministères et organismes...	346,626	87,648 ⁵	78,800	14,657	2,820	530,551 ⁵

¹ Estimates.² Funds received may be used for capital projects.³ Mainly provincial governments.⁴ Mainly scholarships and fellowships abroad.⁵ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDA) grants. There is not a real increase in government expenditures of this amount since the IRDA program replaces the additional allowance of Section 72 A of the Income Tax Act.¹ Estimations.² Les fonds reçus peuvent être dépensés en immobilisations.³ Surtout les administrations provinciales.⁴ Surtout les bourses d'études et perfectionnement et à l'étranger.⁵ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques. Cette somme ne constitue pas une augmentation réelle de la dépense publique, car le programme de stimulation remplace la déduction supplémentaire prévue à l'article 72 A de la Loi de l'impôt sur le revenu.

TABLE 11. Current Expenditures of the Federal Government on Research and Development, by Performer, Fiscal Year 1966-67¹
TABLEAU 11. Dépenses courantes de l'administration fédérale en recherche et développement, par exécutant, exercice 1966-67¹

Department or agency — Ministère ou organisme	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ² — Établissements canadiens d'enseignement et sans but lucratif ²	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign — Exécutants à l'étranger	Total
thousands of dollars — milliers de dollars						
Agriculture	33,020	—	431	12	—	33,463
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	—	634	—	634
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	2,000	—	—	2,000
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	41,456	6,551	397	16	130	48,550
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée	166	—	—	—	—	166
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	27	17	2	34	—	80
Dominion Coal Board — Office fédérale du charbon	—	6	3	5	—	14
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	1,015	—	25	—	—	1,040
Geological Survey of Canada — Commission géologique du Canada	4,838	—	149	—	—	4,987
Inland Waters — Direction des eaux intérieures	1,242	—	38	—	—	1,280
Marine Sciences — Sciences de la mer	4,050	—	—	—	—	4,050
Mines	5,897	—	100	—	—	5,997
Observatories — Observatoires	3,397	—	31	—	—	3,428
Polar Continental Shelf Project — Étude du plateau continental polaire	45	8	—	—	—	53
Surveys and Mapping — Levés et cartographie	102	—	13	—	—	115
Sub-totals — Totaux partiels	20,586	8	356	—	—	20,950
Fisheries — Pêcheries:						
Branches — Directions	3,912	27	19	627	—	4,585
Fisheries Research Board — Office des recherches sur les pêcheries	9,099	—	250	—	—	9,349
Sub-totals — Totaux partiels	13,011	27	269	627	—	13,934
Forestry and Rural Development — Forêts et Développement rural	10,105	749	84	—	—	10,938
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien:						
Canadian Wildlife Service — Service canadien de la faune	1,495	—	87	—	—	1,582
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	—	—	322	—	—	322
Sub-totals — Totaux partiels	1,495	—	409	—	—	1,904
Industry — Industrie	—	25,781	1,443	—	—	27,224
Medical Research Council — Conseil de la recherche médicale	157	16	11,191	6	—	11,370
National Defence — Défense nationale:						
Canadian Armed Forces — Forces armées canadiennes	1,500	15,841	—	—	108	17,449
Defence Research Board — Conseil de recherches pour la défense	35,272	5,281	2,865	33	—	43,451
Sub-totals — Totaux partiels	36,772	21,122	2,865	33	108	60,900
National Health and Welfare — Santé nationale et Bien-être social	2,647	—	4,422	2,327	—	9,396
National Research Council — Conseil national de recherches	37,721	4,199	29,112	388	606	72,026
Post Office — Postes:						
Engineering Branch — Direction du génie	249	8	—	—	—	257
Public Works — Travaux publics:						
Testing Laboratories — Laboratoires d'essais	415	—	—	—	—	415
Secretary of State — Secrétariat d'État:						
National Film Board — Office national du film	83	—	—	—	—	83
National Gallery — Galerie nationale	111	—	—	—	—	111
National Museum — Musée national	476	—	—	75	—	551
Sub-totals — Totaux partiels	670	—	—	75	—	745
Transports — Transports:						
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	30	—	—	—	—	30
Marine Services — Services de la marine	167	85	—	—	—	252
Meteorological Branch — Direction de la météorologie	1,739	—	187	10	—	1,936
Telecommunications and Electronics — Télécommunications et électronique...	285	290	—	—	—	575
Sub-totals — Totaux partiels	2,221	375	187	10	—	2,793
Veterans Affairs — Affaires des anciens combattants	428	—	—	—	—	428
All departments and agencies — Total — Tous ministères et organismes...	201,146	58,859	53,171	4,167	844	318,187

¹ Revised when necessary.² Funds received may be used for capital projects.³ Mainly provincial governments.¹ Chiffres rectifiés au besoin.² Les fonds recus peuvent être dépensés en immobilisations.³ Surtout les administrations provinciales.

TABLE 12. Current Expenditures of the Federal Government on Research and Development, by Performer, Fiscal Year 1967-68¹TABLEAU 12. Dépenses courantes de l'administration fédérale en recherche et développement, par exécutant, exercice 1967-68¹

Department or agency — Ministère ou organisme	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ² — Établissements canadiens d'enseignement et sans but lucratif ²	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign — Exécutants à l'étranger	Total
thousands of dollars — milliers de dollars						
Agriculture	35,819	—	613	12	—	36,444
Atlantic Development Board — Office d'expansion économique de la région de l'Atlantique	—	—	500	2,075	—	2,575
Atomic Energy Control Board — Commission de contrôle de l'énergie atomique	—	—	2,500	—	—	2,500
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	50,529	6,439	495	110	100	57,673
Canadian Arsenals Limited — Les Arsenaux canadiens Limitée	116	—	—	—	—	116
Central Mortgage and Housing Corporation — Société centrale d'hypothèques et de logement	23	19	1	27	—	70
Dominion Coal Board — Office fédéral du charbon	—	4	3	17	—	24
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	1,134	—	35	—	—	1,169
Geological Survey of Canada — Commission géologique du Canada	5,561	—	185	—	—	5,746
Inland Waters — Direction des eaux intérieures	3,089	—	250	—	—	3,339
Marine Sciences — Sciences de la mer	4,783	—	—	—	—	4,783
Mines	6,711	—	100	—	—	6,811
Observatories — Observatoires	4,126	—	49	—	—	4,175
Polar Continental Shelf Project — Étude du plateau continental polaire	69	—	—	—	—	69
Surveys and Mapping — Levés et cartographie	155	—	21	—	—	176
Sub-totals — Totaux partiels	25,628	—	640	—	—	26,268
Fisheries — Pêcheries:						
Branches — Directions	4,558	45	21	1,177	—	5,801
Fisheries Research Board — Office des recherches sur les pêcheries	11,148	—	400	—	—	11,548
Sub-totals — Totaux partiels	15,706	45	421	1,177	—	17,349
Forestry and Rural Development — Forêts et Développement rural	12,873	250	330	—	—	13,453
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien:						
Canadian Wildlife Service — Service canadien de la faune	2,254	—	154	—	—	2,408
Northern Co-ordination and Research Centre — Centre de coordination et de recherches sur le Nord	—	—	364	—	—	364
Sub-totals — Totaux partiels	2,254	—	518	—	—	2,772
Industrie — Industrie	—	53,742 ⁴	123	—	—	53,865 ⁴
Medical Research Council — Conseil de la recherche médicale	219	—	18,501	9	—	18,729
National Defence — Défense nationale:						
Canadian Armed Forces — Forces armées canadiennes	1,500	12,518	—	—	496	14,514
Defence Research Board — Conseil de recherches pour la défense	42,905	5,369	3,716	68	—	51,758
Sub-totals — Totaux partiels	44,405	17,587	3,716	68	496	66,272
National Health and Welfare — Santé nationale et Bien-être social	3,845	—	4,429	10,329	—	18,603
National Research Council — Conseil national de recherches	43,612	5,200	37,884	418	982	88,096
Post Office — Postes:						
Engineering Branch — Direction du génie	229	7	—	—	—	236
Public Works — Travaux publics:						
Testing Laboratories — Laboratoires d'essais	461	—	12	—	—	473
Secretary of State — Secrétariat d'État:						
National Film Board — Office national du film	104	—	—	—	—	104
National Gallery — Galerie nationale	158	—	—	—	—	158
National Museum — Musée national	691	—	—	80	—	771
Sub-totals — Totaux partiels	953	—	—	80	—	1,033
Transports — Transports:						
Construction Engineering and Architectural Branch — Direction de la construction et de l'architecture	43	—	—	—	—	43
Marine Services — Services de la marine	530	615	—	—	—	1,145
Meteorological Branch — Direction de la météorologie	2,159	—	284	10	—	2,453
Telecommunications and Electronics — Télécommunications et électronique	554	292	—	—	—	846
Sub-totals — Totaux partiels	3,286	907	284	10	—	4,487
Veterans Affairs — Affaires des anciens combattants	415	—	—	—	—	415
All departments and agencies — Total — Tous ministères et organismes	240,373	84,200	70,970	14,332	1,578	411,453

¹ Estimates.² Funds received may be used for capital projects.³ Mainly provincial governments.⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDA) grants.¹ Estimations.² Les fonds reçus peuvent être dépensés en immobilisations.³ Surtout les administrations provinciales.⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques.

TABLE 13. Expenditures of the Federal Government on Scientific Activities, by Performer and Activity, Fiscal Year 1966-67¹
TABLEAU 13. Dépenses de l'administration fédérale en activités scientifiques, par exécutant et par activité, exercice 1966-67¹

Type of expenditure and activity Genre de dépense et d'activité	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ³ — Établissements canadiens d'enseignement et sans but lucratif ³	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign — Exécutants à l'étranger	Total
millions of dollars — millions de dollars						
Current expenditures — Dépenses courantes:						
Research and development — Recherche et développement	201.1	58.9	53.2	4.2	0.8	318.2
Scientific data collection — Collecte de données scientifique	51.2	2.4	0.1	—	—	53.7
Scientific information — Information scientifique	17.0	—	0.6	0.3	0.1	18.0
Testing and standardization — Tests et normalisation	18.5	0.8	—	—	—	19.3
Scholarships and fellowships ⁴ — Bourses d'études et perfectionnement ⁴	1.0	—	5.0	—	0.9	6.7
Sub-totals — Totaux partiels	288.8	62.1	58.9	4.5	1.8	415.9
Capital expenditures — Dépenses en immobilisations:						
For R & D — Pour travaux de recherche et de développement	50.0	—	—	—	—	50.0
For other scientific activities — Pour d'autres activités scientifiques	9.7	—	—	—	—	9.7
Sub-totals — Totaux partiels	59.7	—	—	—	—	59.7
Total ⁵	348.5	62.1	58.9	4.5	1.8	475.7

¹ Revised when necessary.

² Funds received may be used for capital purposes.

³ Mainly provincial governments.

⁴ The value of scholarships and fellowships intended to support research is included in R & D expenditures.

⁵ Totals may not add exactly due to rounding.

¹ Chiffres rectifiés au besoin.

² Les fonds reçus peuvent être dépensés en immobilisations.

³ Surtout les administrations provinciales.

⁴ La valeur des bourses d'études et perfectionnement destinées à la recherche est incluse dans les dépenses courantes de recherche et de développement.

⁵ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

TABLE 14. Expenditures of the Federal Government on Scientific Activities, by Performer and Activity, Fiscal Year 1967-68¹
TABLEAU 14. Dépenses de l'administration fédérale en activités scientifiques, par exécutant et par activité, exercice 1967-68¹

Type of expenditure and activity Genre de dépense et d'activité	Federal Government — Administration fédérale	Canadian industry ² — Industrie canadienne ²	Canadian educational and non-profit institutions ³ — Établissements canadiens d'enseignement et sans but lucratif ³	Other Canadian ^{2,3} — Autres exécutants canadiens ^{2,3}	Foreign — Exécutants à l'étranger	Total
millions of dollars — millions de dollars						
Current expenditures — Dépenses courantes:						
Research and development — Recherche et développement	240.4	84.2 ⁴	71.0	14.3	1.6	411.5
Scientific data collection — Collecte de données scientifiques	65.9	2.6	0.1	—	—	68.6
Scientific information — Information scientifique	19.5	—	0.8	0.4	0.1	20.8
Testing and standardization — Tests et normalisation	19.7	0.8	—	—	—	20.6
Scholarships and fellowships ^{4,5} — Bourses d'études et perfectionnement ^{4,5}	1.1	—	6.9	—	1.1	9.2
Sub-totals — Totaux partiels	346.6	87.6	78.8	14.7	2.8	530.6
Capital expenditures — Dépenses en immobilisations:						
For R & D — Pour travaux de recherche et de développement	57.6	—	—	—	—	57.6
For other scientific activities — Pour d'autres activités scientifiques	13.4	—	—	—	—	13.4
Sub-totals — Totaux partiels	71.0	—	—	—	—	71.0
Total ⁶	417.6	87.6	78.8	14.7	2.8	601.5

¹ Estimates.

² Funds received may be used for capital purposes.

³ Mainly provincial governments.

⁴ Including \$19.3 million budgeted for the Industrial Research and Development Incentives Act (IRDIA) grants.

⁵ The value of scholarships and fellowships intended to support research is included in R & D expenditures.

⁶ Totals may not add exactly due to rounding.

¹ Estimations.

² Les fonds reçus peuvent être dépensés en immobilisations.

³ Surtout les administrations provinciales.

⁴ Dont 19.3 millions de dollars destinés des subventions en vertu de la Loi stimulant la recherche et le développement scientifiques.

⁵ La valeur des bourses d'études et perfectionnement destinées à la recherche est incluse dans les dépenses courantes de recherche et de développement.

⁶ Les totaux ne sont peut-être pas exacts en raison de l'arrondissement des chiffres.

**TABLE 15. Current Intramural Expenditures of the Federal Government on Research and Development,¹
by Category of R & D, Fiscal Years 1966-67 and 1967-68**

**TABLEAU 15. Dépenses courantes intra-muros de l'administration fédérale en recherche et développement¹,
par catégorie de R & D, exercices 1966-67 et 1967-68**

Department or agency — Ministère ou organisme	1966-67 ²				1967-68 ³			
	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total
thousands of dollars — milliers de dollars								
Agriculture	3,304	26,507	3,209	33,020	3,591	28,748	3,480	35,819
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	11,715	25,280	4,461	41,456	10,259	34,546	5,724	50,529
Canadian Arsenal Limited — Les Arsenaux canadiens Limitée	—	—	166	166	—	—	116	116
Energy, Mines and Resources — Énergie, Mines et Ressources:								
Geographical Branch — Direction de la géographie	807	208	—	1,015	900	234	—	1,134
Geological Survey of Canada — Commission géologique du Canada	1,693	3,097	48	4,838	1,947	3,559	55	5,561
Inland Waters — Direction des eaux intérieures	—	1,242	—	1,242	—	3,089	—	3,089
Marine Sciences — Sciences de la mer	3,128	512	410	4,050	3,668	655	460	4,783
Mines	1,179	2,477	2,241	5,897	1,383	2,780	2,548	6,711
Observatories — Observatoires	2,344	849	204	3,397	2,847	1,032	247	4,126
Polar Continental Shelf Project — Étude du plateau continental polaire	39	2	4	45	46	10	13	69
Surveys and Mapping — Levés et cartographie	—	42	60	102	—	75	80	155
Sub-totals — Totaux partiels	9,190	8,429	2,967	20,586	10,791	11,434	3,403	25,628
Fisheries — Pêcheries:								
Branches — Directions	—	423	3,489	3,912	—	482	4,076	4,558
Fisheries Research Board — Office des recherches sur les pêch- eries	—	8,773	326	9,099	—	10,701	477	11,148
Sub-totals — Totaux partiels	—	9,196	3,815	13,011	—	11,183	4,523	15,706
Forestry and Rural Development — Forêts et Développement rural	1,010	7,580	1,515	10,105	1,288	9,655	1,930	12,873
Indian Affairs and Northern Development — Affaires indiennes et Nord Canadien:								
Canadian Wildlife Service — Service canadien de la faune	498	498	499	1,495	751	751	752	2,254
National Defence — Défense nationale	—	35,647	1,125	36,772	—	43,280	1,125	44,405
National Health and Welfare — Santé nationale et Bien-être social	—	2,140	352	2,492	—	3,162	520	3,682
National Research Council — Conseil national de recherches	17,697	16,272	3,462	37,431	20,468	18,703	3,815	42,986
Post Office — Postes:								
Engineering Branch — Direction du génie	—	—	249	249	—	—	229	229
Public Works — Travaux publics:								
Testing Laboratories — Laboratoires d'essais	—	—	415	415	—	—	461	461
Secretary of State — Secrétariat d'État	536	40	94	670	771	60	122	953
Transport — Transports:								
Meteorological Branch — Direction de la météorologie	64	1,171	477	1,712	178	1,508	446	2,132
Other branches — Autres directions	—	5	477	482	—	8	1,119	1,127
Sub-totals — Totaux partiels	64	1,176	954	2,194	178	1,516	1,565	3,259
Veterans Affairs — Affaires des anciens combattants	—	428	—	428	—	415	—	415
All departments and agencies — Total — Tous ministères et organismes	44,014	133,193	23,283	200,490	48,097	163,453	27,765	239,315

¹ Excluding costs of administering R & D grants and contracts.

² Revised when necessary.

³ Estimates.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Chiffres rectifiés au besoin.

³ Estimations.

**TABLE 16. Current Intramural Expenditures of the Federal Government on R & D in Engineering and Technology,¹
Fiscal Year 1966 - 67²**

**TABLEAU 16. Dépenses courantes *intra-muros* de l'administration fédérale en R & D — génie et technologie¹,
exercice 1966 - 67²**

Department or agency — Ministère ou organisme	Aeronautical and aerospace — Aéronautique et aérospatial	Chemical — Chimique	Civil	Electrical and electronic — Électrique et électronique	Hydraulic — Hydraulique	Mechanical — Mécanique	Metal-lurgy and materials — Métallurgie et matériaux	Nuclear — Nucléaire	Other — Autres	Total
thousands of dollars — milliers de dollars										
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	4,461	1,487	3,272	—	6,840	1,487	9,518	2,676	29,741
Energy, Mines and Resources — Énergie, Mines et Ressources	—	246	104	—	—	298	—	—	3,252	3,900
Fisheries — Pêcheries	—	—	—	—	845	236	—	—	947	2,028
Forestry and Rural Development — Forêts et Développement rural	—	—	304	—	—	404	—	—	—	708
National Defence — Défence nationale	529	529	176	8,818	706	2,469	—	—	—	13,227
National Research Council — Conseil national de recherches	3,356	1,378	1,072	1,935	1,185	3,393	683	—	372	13,374
Transport — Transports	—	—	20	295	167	—	—	—	—	482
Others — Autres	—	191	307	125	—	207	—	—	—	830
All departments and agencies — Total — Tous ministères et organismes	3,885	6,805	3,470	14,445	2,903	13,847	2,170	9,518	7,247	64,290

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Revised when necessary.

² Chiffres rectifiés au besoin.

**TABLE 17. Current Intramural Expenditures of the Federal Government on R & D in Engineering and Technology,¹
Fiscal Year 1967 - 68²**

**TABLEAU 17. Dépenses courantes *intra-muros* de l'administration fédérale en R & D — génie et technologie¹,
exercice 1967 - 68²**

Department or agency — Ministère ou organisme	Aeronautical and aerospace — Aéronautique et aérospatial	Chemical — Chimique	Civil	Electrical and electronic — Électrique et électronique	Hydraulic — Hydraulique	Mechanical — Mécanique	Metal-lurgy and materials — Métallurgie et matériaux	Nuclear — Nucléaire	Other — Autres	Total
thousands of dollars — milliers de dollars										
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	6,041	2,013	4,430	—	9,262	2,013	12,887	3,624	40,270
Energy, Mines and Resources — Énergie, Mines et Ressources	—	276	158	—	—	334	—	—	4,865	5,633
Fisheries — Pêcheries	—	—	—	—	965	292	—	—	1,168	2,425
Forestry and Rural Development — Forêts et Développement rural	—	—	386	—	—	515	—	—	—	901
National Defence — Défence nationale	644	644	215	10,726	858	3,003	—	—	—	16,090
National Research Council — Conseil national de recherches	3,844	1,603	1,285	2,233	1,432	3,827	804	—	460	15,488
Transport — Transports	—	—	33	564	530	—	—	—	—	1,127
Others — Autres	—	178	341	105	—	182	—	—	—	806
All departments and agencies — Total — Tous ministères et organismes	4,488	8,742	4,431	18,058	3,785	17,415	2,817	12,887	10,117	82,740

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Estimates.

² Estimations.

TABLE 18. Current Intramural Expenditures of the Federal Government on R & D in the Physical Sciences,¹ Fiscal Year 1966-67²

TABLEAU 18. Dépenses courantes *intra-muros* de l'administration fédérale en R & D — sciences physiques¹, exercice 1966-67²

Department or agency — Ministère ou organisme	Astronomy — Astronomie	Chemistry — Chimie	Geology and other solid earth science — Géologie et autres sciences de la terre	Mathe- matics — Mathé- matiques	Meteorology and other atmospheric sciences — Météorologie et autres sciences de l'atmosphère	Oceano- graphy — Océano- graphie	Physics — Physique	Other — Autres	Total
thousands of dollars — milliers de dollars									
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	2,490	—	766	—	—	4,215	2,107	9,578
Energy, Mines and Resources — Énergie, Mines et Ressources	1,698	1,128	8,864	—	—	4,154	842	—	16,686
Fisheries — Pêcheries	—	123	—	—	—	692	—	—	815
Forestry and Rural Development — Forêts et Dé- veloppement rural	—	506	—	—	—	—	303	—	809
National Defence — Défense nationale	—	6,173	705	—	705	1,411	10,582	—	19,576
National Research Council — Conseil national de recherches	1,589	4,683	1,130	377	102	105	11,966	—	19,952
Transport — Transports	—	—	—	—	1,712	—	—	—	1,712
Others — Autres	—	111	—	—	—	—	—	83	194
All departments and agencies — Total — Tous ministères et organismes	3,287	15,214	10,699	1,143	2,519	6,362	27,908	2,190	69,322

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Revised when necessary.

² Chiffres rectifiés au besoin.

TABLE 19. Current Intramural Expenditures of the Federal Government on R & D in the Physical Sciences,¹ Fiscal Year 1967-68²

TABLEAU 19. Dépenses courantes *intra-muros* de l'administration fédérale en R & D — sciences physiques¹, exercice 1967-68²

Department or agency — Ministère ou organisme	Astronomy — Astronomie	Chemistry — Chimie	Geology and other solid earth sciences — Géologie et autres sciences de la terre	Mathe- matics — Mathé- matiques	Meteorology and other atmospheric sciences — Météorologie et autres sciences de l'atmosphère	Oceano- graphy — Océano- graphie	Physics — Physique	Other — Autres	Total
thousands of dollars — milliers de dollars									
Atomic Energy of Canada Limited — L'Énergie atomique du Canada	—	2,270	—	699	—	—	3,843	1,921	8,733
Energy, Mines and Resources — Énergie, Mines et Ressources	2,062	1,297	10,295	—	—	5,383	958	—	19,995
Fisheries — Pêcheries	—	138	—	—	—	1,040	—	—	1,178
Forestry and Rural Development — Forêts et Dé- veloppement rural	—	644	—	—	—	—	385	—	1,029
National Defence — Défense nationale	—	7,508	858	—	858	1,716	12,872	—	23,812
National Research Council — Conseil national de recherches	1,720	5,434	1,306	400	120	117	13,526	—	22,623
Transport — Transports	—	—	—	—	2,132	—	—	—	2,132
Others — Autres	—	158	—	—	—	—	—	104	262
All departments and agencies — Total — Tous ministères et organismes	3,782	17,449	12,459	1,099	3,110	8,256	31,584	2,025	79,764

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Estimates.

² Estimations.

TABLE 20. Current Intramural Expenditures of the Federal Government on R & D in the Life Sciences,¹
Fiscal Years 1966-67 and 1967-68

TABLEAU 20. Dépenses courantes *intra-muros* de l'administration fédérale en R & D — sciences de la vie¹,
exercices 1966-67 et 1967-68

Department or agency Ministère ou organisme	1966-67 ²				1967-68 ³			
	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales	Total	Agricultural sciences — Sciences agricoles	Biological sciences — Sciences biologiques	Medical sciences — Sciences médicales	Total
thousands of dollars — milliers de dollars								
Agriculture	33,020	—	—	33,020	35,819	—	—	35,819
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	2,137	—	2,137	—	1,526	—	1,526
Fisheries — Pêcheries	—	10,168	—	10,168	—	12,103	—	12,103
Forestry and Rural Development — Forêts et Développement rural	6,567	2,021	—	8,588	8,368	2,575	—	10,943
Indian Affairs and Northern Development — Affaires indien- nes et Nord canadien	—	1,495	—	1,495	—	2,254	—	2,254
National Defence — Défense nationale	—	1,911	2,058	3,969	—	2,216	2,287	4,503
National Health and Welfare — Santé nationale et Bien-être social	—	—	2,492	2,492	—	—	3,682	3,682
National Research Council — Conseil national de recherches	630	3,453	22	4,105	681	4,190	4	4,875
Other — Autres	—	476	428	904	—	691	415	1,106
All departments and agencies — Total — Tous ministères et organismes	40,217	21,661	5,000	66,878	44,868	25,555	6,388	76,811

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Revised when necessary.

² Chiffres rectifiés au besoin.

³ Estimates.

³ Estimations.

TABLE 21. Current Intramural Expenditures of the Federal Government on R & D,¹ by Category of R & D and Field of Science,
Fiscal Years 1966-67 and 1967-68

TABLEAU 21. Dépenses courantes *intra-muros* de l'administration fédérale en R & D¹, par catégorie de R & D et par domaine
scientifique, exercices 1966-67 et 1967-68

Field of science Domaine scientifique	1966-67 ²				1967-68 ³			
	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total	Basic research — Recherche fondamentale	Applied research — Recherche appliquée	Develop- ment — Dévelop- pement	Total
thousands of dollars — milliers de dollars								
Engineering and technology — Génie et technologie:								
Chemical — Chimie	—	5,708	1,097	6,805	32	7,400	1,310	8,742
Electrical and electronic — Électrique et électronique	568	12,625	1,252	14,445	637	15,804	1,617	18,058
Mechanical — Mécanique	467	10,684	2,696	13,847	527	13,709	3,179	17,415
Nuclear — Nucléaire	—	8,090	1,428	9,518	—	11,055	1,832	12,887
Other — Autres	1,439	13,033	5,203	19,675	1,675	17,373	6,590	25,638
Sub-totals — Totaux partiels	2,474	50,140	11,676	64,290	2,871	65,341	14,528	82,740
Physical sciences — Sciences physiques:								
Chemistry — Chimie	5,623	9,323	268	15,214	5,911	11,218	320	17,449
Earth sciences — Sciences de la terre	7,085	10,405	2,090	19,580	8,403	13,125	2,297	23,825
Physics — Physique	13,381	13,836	691	27,908	14,203	16,578	803	31,584
Other — Autres	5,375	947	298	6,620	5,510	1,169	227	6,906
Sub-totals — Totaux partiels	31,464	34,511	3,347	69,322	34,027	42,090	3,647	79,764
Life sciences — Sciences de la vie:								
Agricultural — Sciences agricoles	4,075	31,864	4,278	40,217	4,505	35,532	4,831	44,868
Biological — Sciences biologiques	5,985	12,796	2,880	21,661	6,694	15,372	3,489	25,555
Medical — Sciences médicales	16	3,882	1,102	5,000	—	5,118	1,270	6,388
Sub-totals — Totaux partiels	10,076	48,542	8,260	66,878	11,199	56,022	9,590	76,811
All fields — Total — Tous domaines scientifiques	44,014	133,193	23,283	200,490	48,097	163,453	27,765	239,315

¹ Excluding the costs of administering R & D grants and contracts.

¹ Sans les frais d'administration des subventions et contrats de recherche et de développement.

² Revised when necessary.

² Chiffres rectifiés au besoin.

³ Estimates.

³ Estimations.

TABLE 22. Current Expenditures¹ of the Federal Government for Applied Research and Development, by Area of Application, Fiscal Year 1966-67²

TABLÉAU 22. Dépenses courantes¹ de l'administration fédérale en recherche appliquée et développement, par champ d'application, exercice 1966-67²

Department or agency — Ministère ou organisme	Nuclear science — Science nucléaire	Space travel and communications — Voyages et communications spatiaux	Military science — Science militaire	Agriculture, fishing and forestry — Agriculture, pêche et exploitation forestière	Construction	Transportation — Transports
thousands of dollars — milliers de dollars						
Agriculture	—	—	—	30, 114	—	—
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	36, 438	—	—	—	—	—
Energy, Mines and Resources — Énergie, Mines et Ressources	—	—	—	—	—	—
Fisheries — Pêcheries	—	—	—	13, 684	—	—
Forestry and Rural Development — Forêts et Développement rural	—	—	—	9, 657	—	—
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	—	—	—	1, 055	—	—
Industry — Industrie	—	—	22, 626	—	—	—
Medical Research Council — Conseil de la recherche médicale	—	—	—	—	—	—
National Defence — Défence nationale	—	4, 326	55, 271	—	—	—
National Health and Welfare — Santé nationale et Bien-être social	—	—	—	—	—	—
National Research Council — Conseil national de recherches	316	933	746	776	2, 853	4, 693
Transport — Transports	—	241	—	—	—	1, 969
Veterans Affairs — Affaires des anciens combattants	—	—	—	—	—	—
Other — Autres	—	—	166	—	408	33
All departments and agencies — Total — Tous ministères et organismes	36, 754	5, 500	78, 809	55, 286	3, 261	6, 695
	Telecom- munications — Télécom- munications	Health and hygiene — Santé et hygiène	Industry — Industrie	Research on behalf of under-developed areas — Recherche pour le compte de régions sous- développées	Other — Autres	Total
thousands of dollars — milliers de dollars						
Agriculture	—	—	—	—	—	30, 114
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	—	—	—	—	36, 438
Energy, Mines and Resources — Énergie, Mines et Ressources	—	—	1, 099	3, 353	7, 003	11, 455
Fisheries — Pêcheries	—	—	—	—	—	13, 684
Forestry and Rural Development — Forêts et Développement rural	—	—	—	—	—	9, 657
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	—	—	—	322	—	1, 377
Industry — Industrie	—	—	4, 598	—	—	27, 224
Medical Research Council — Conseil de la recherche médicale	—	871	—	—	—	871
National Defence — Défence nationale	—	1, 303	—	—	—	60, 900
National Health and Welfare — Santé nationale et Bien-être social	—	9, 396	—	—	—	9, 396
National Research Council — Conseil national de recherches	681	150	12, 968	—	—	24, 116
Transport — Transports	334	—	—	—	—	2, 544
Veterans Affairs — Affaires des anciens combattants	—	428	—	—	—	428
Other — Autres	—	54	731	—	308	1, 700
All departments and agencies — Total — Tous ministères et organismes	1, 015	12, 202	19, 396	3, 675	7, 311	229, 904

¹ Some of the expenditures, though current for the Federal Government, are used for the capital programmes of others, e.g. ADB's grants for Atlantic research facilities, NHW's grants to the provinces for medical research facilities, NRC's university equipment grants.

² Revised when necessary.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements d'autres organismes; par exemple, les subventions l'Office d'expansion économique de la région de l'Atlantique pour installations de recherche et de développement dans les provinces atlantiques, celles du ministère de la Santé nationale et Bien-être social aux provinces pour des installations de recherche médicale; et les subventions d'équipement accordées aux universités par le Conseil national de recherches.

² Chiffres rectifiés au besoin.

TABLE 23. Current Expenditures¹ of the Federal Government for Applied Research and Development, by Area of Application, Fiscal Year 1967-68²

TABLEAU 23. Dépenses courantes¹ de l'administration fédérale en recherche appliquée et développement, par champ d'application, exercice 1967-68²

Department or agency — Ministère ou organisme	Nuclear science — Science nucléaire	Space travel and communications — Voyages et communications spatiaux	Military science — Science militaire	Agriculture, fishing and forestry — Agriculture, pêche et exploitation forestière	Construction	Transportation — Transports
thousands of dollars — milliers de dollars						
Agriculture	—	—	—	32,791	—	—
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	46,919	—	—	—	—	—
Energy, Mines and Resources — Énergie, Mines et Ressources	—	—	—	—	—	—
Fisheries — Pêcheries	—	—	—	16,949	—	—
Forestry and Rural Development — Forêts et Développement rural	—	—	—	12,045	—	—
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien ..	—	—	—	1,606	—	—
Industry — Industrie	—	—	25,000	—	—	—
Medical Research Council — Conseil de la recherche médicale	—	—	—	—	—	—
National Defence — Défense nationale	—	5,200	59,520	—	—	—
National Health and Welfare — Santé nationale et Bien-être social	—	—	—	—	—	—
National Research Council — Conseil nationale de recherches	364	1,178	656	823	3,422	5,398
Transport — Transports	—	272	—	—	—	3,251
Veteran Affairs — Affaires des anciens combattants	—	—	—	—	—	—
Other — Autres	—	—	116	—	437	37
All departments and agencies — Total — Tous ministères et organismes	47,283	6,650	85,292	64,214	3,859	8,686
thousands of dollars — milliers de dollars						
	Telecom- munications — Télécom- munications	Health and hygiene — Santé et hygiène	Industry — Industrie	Research on behalf of under- developed areas — Recherche pour le compte de régions sous- développées	Other — Autres	Total
Agriculture	—	—	—	—	—	32,791
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	—	—	—	—	—	46,919
Energy, Mines and Resources — Énergie, Mines et Ressources	—	—	1,225	3,848	10,035	15,108
Fisheries — Pêcheries	—	—	—	—	—	16,949
Forestry and Rural Development — Forêts et Développement rural	—	—	—	—	—	12,045
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien ..	—	—	—	364	—	1,970
Industry — Industrie	—	—	28,093	—	—	53,093
Medical Research Council — Conseil de la recherche médicale	—	1,771	—	—	—	1,771
National Defence — Défense nationale	—	1,552	—	—	—	66,272
National Health and Welfare — Santé nationale et Bien-être social	—	18,603	—	—	—	18,603
National Research Council — Conseil nationale de recherches	637	185	15,281	—	—	27,944
Transport — Transports	574	—	—	—	—	4,097
Veteran Affairs — Affaires des anciens combattants	—	415	—	—	—	415
Other — Autres	—	57	2,703	—	314	3,664
All departments and agencies — Total — Tous ministères et organismes	1,211	22,583	47,302	4,212	10,349	301,641

¹ Some of the expenditures, though current for the Federal Government, are used for the capital programmes of others, e.g. ADB's grants for Atlantic research facilities, NHW's grants to the provinces for medical research facilities, NRC's university equipment grants.

² Estimates.

¹ Certaines dépenses, bien que courantes pour l'administration fédérale, servent aux programmes d'investissements d'autres organismes; par exemple, les subventions l'Office d'expansion économique de la région de l'Atlantique pour installations de recherche et de développement dans les provinces atlantiques, celles du ministère de la Santé nationale et Bien-être social aux provinces pour des installations de recherche médicale; et les subventions d'équipement accordées aux universités par le Conseil national de recherches.

² Estimations.

TABLE 24. Permanent Staff of the Federal Government Engaged in R & D, as of 31 March 1966¹
TABLEAU 24. Personnel permanent de l'administration fédérale affecté à la R & D, 31 mars 1966¹

Department or agency — Ministère ou organisme	Scientists and engineers — Cadres scientifiques et techniques				Supporting personnel — Personnel de soutien	Total
	Bachelors — Bacheliers	Master — Maîtres	Doctors — Docteurs	Total		
	full-time equivalent — en équivalent de plein temps					
Agriculture	144	243	518	905	2, 293	3, 198
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	338	63	131	532	2, 400	2, 932
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	15	8	5	28	40	68
Geological Survey of Canada — Commission géologique du Canada	21	20	102	143	156	299
Inland Waters — Direction des eaux intérieures	20	4	1	25	27	52
Marine Sciences — Sciences de la mer	11	10	26	47	86	133
Mines	136	39	60	235	346	581
Observatories — Observatoires	42	28	31	101	94	195
Polar Continental Shelf Projet — Étude du plateau continental polaire	2	2	1	5	2	7
Survey and Mapping — Levés et cartographie	—	—	—	—	—	—
Sub-totals — Totaux partiels	247	111	226	584	751	1, 335
Fisheries — Pêcheries:						
Branches — Directions	84	8	2	94	113	207
Fisheries Research Board — Office des recherches sur les pêcheries	38	65	90	193	381	574
Sub-totals — Totaux partiels	122	73	92	287	494	781
Forestry and Rural Development — Forêts et Développement rural	71	111	138	320	513	833
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	11	32	17	60	45	105
National Defence — Défense nationale	207	202	181	590	2, 062	2, 652
National Health and Welfare — Santé nationale et Bien-être social	41	28	86	155	162	317
National Research Council — Conseil national de recherches	152	167	380	699	1, 867	2, 566
Transport — Transports:						
Meteorological Branch — Direction de la météorologie	18	42	9	69	80	149
Other branches — Autres directions	20	4	—	24	19	43
Sub-totals — Totaux partiels	38	46	9	93	99	192
Veterans Affairs — Affaires des anciens combattants	9	16	8	33	44	77
Other — Autres	27	6	14	47	62	109
All departments and agencies — Total — Tous ministères et organismes	1, 407	1, 098	1, 900	4, 305	10, 792	15, 097

¹ Revised when necessary.

¹ Chiffres rectifiés au besoin.

TABLE 25. Permanent Staff of the Federal Government Engaged in R & D, as of 31 March 1967
TABLEAU 25. Personnel permanent de l'administration fédérale affecté à la R & D, 31 mars 1967

Department or agency — Ministère ou organisme	Scientists and engineers — Cadres scientifiques et techniques				Supporting personnel — Personnel de soutien				Total
	Bachelors — Bacheliers	Masters — Maîtres	Doctors — Docteurs	Total	Administrators ¹ — Administrateurs ¹	Technicians — Techniciens	Other — Autres	Total	
	full-time equivalent — en équivalent de plein temps								
Agriculture	134	220	551	905	70	629	1, 620	2, 249	3, 154
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	364	104	162	630	14	700	1, 854	2, 554	3, 184
Energy, Mines and Resources — Énergie, Mines et Ressources:									
Geographical Branch — Direction de la géographie	20	16	8	44	1	33	21	54	98
Geological Survey of Canada — Commission géologique du Canada	29	21	140	190	8	59	176	235	425
Inland Waters — Direction des eaux intérieures	59	18	8	85	4	10	9	19	104
Marine Sciences — Sciences de la mer	8	17	34	59	—	98	6	104	163
Mines	160	32	66	258	26	244	188	432	690
Observatories — Observatoires	38	16	28	82	2	63	47	110	192
Polar Continental Shelf Projet — Étude du plateau continental polaire	—	—	1	1	1	1	1	2	3
Surveys and Mapping — Levés et cartographie	10	2	—	12	—	—	—	—	12
Sub-totals — Totaux partiel	324	122	285	731	42	508	448	956	1, 687
Fisheries — Pêcheries:									
Branches — Directions	116	14	1	131	21	123	20	143	274
Fisheries Research Board — Office des recherches sur les pêcheries	35	68	102	205	7	232	252	484	689
Sub-totals — Totaux partiels	151	82	103	336	28	355	272	627	963
Forestry and Rural Development — Forêts et Développement rural	71	130	188	389	33	551	268	819	1, 208
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	9	37	23	69	4	23	36	59	128
National Defence — Défense nationale	237	192	179	608	31	839	1, 271	2, 110	2, 718
National Health and Welfare — Santé nationale et Bien-être social	83	32	89	204	3	139	57	196	400
National Research Council — Conseil national de recherches	145	164	424	733	17	757	1, 209	1, 966	2, 699
Transport — Transports:									
Meteorological Branch — Direction de la météorologie	16	33	7	56	3	63	7	70	126
Other branches — Autres directions	26	6	—	32	5	12	7	19	51
Sub-totals — Totaux partiels	42	39	7	88	8	75	14	89	177
Veterans Affairs — Affaires des anciens combattants	8	14	8	30	—	34	4	38	68
Other — Autres	26	7	14	47	8	45	16	61	108
All departments and agencies — Total — Tous ministères et organismes	1, 594	1, 143	2, 033	4, 770	258	4, 655	7, 069	11, 724	16, 494

¹ Included in the total.

¹ Compris dans le total.

TABLE 26. All Staff of the Federal Government Engaged in R & D,¹ 1965-66 and 1966-67

TABLEAU 26. Ensemble du personnel de l'administration fédérale affecté à la R & D¹, 1965-66 et 1966-67

Department or agency — Ministère ou organisme	1965-66 ²			1966-67		
	Scientists and engineers Cadres scientifiques et techniques	Supporting personnel — Personnel de soutien	Total	Scientists and engineers Cadres scientifiques et techniques	Supporting personnel — Personnel de soutien	Total
full-time equivalent — en équivalent de plein temps						
Agriculture.....	907	2,887	3,794	907	2,665	3,572
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	532	2,622	3,154	630	2,754	3,384
Energy, Mines and Resources — Énergie, Mines et Ressources:						
Geographical Branch — Direction de la géographie	40	40	80	66	85	151
Geological Survey of Canada — Commission géologique du Canada	144	160	304	217	299	516
Inland Waters — Direction des eaux intérieures	25	27	52	85	19	104
Marine Sciences — Sciences de la mer	47	178	225	59	196	255
Mines	235	359	594	258	451	709
Observatories — Observatoires	101	94	195	84	123	207
Polar Continental Shelf Project — Étude du plateau continental polaire	5	2	7	2	4	6
Surveys and Mapping — Levés et cartographie	—	—	—	12	1	13
Sub-totals — Totaux partiels	597	860	1,457	783	1,178	1,961
Fisheries — Pêcheries:						
Branches — Directions	95	141	236	132	189	321
Fisheries Research Board — Office des recherches sur les pêcheries	200	393	593	212	496	708
Sub-totals — Totaux partiels	295	534	829	344	685	1,029
Forestry and Rural Development — Forêts et Développement rural	332	613	945	398	960	1,358
Indian Affairs and Northern Development — Affaires indiennes et Nord canadien	69	46	115	78	64	142
National Defence — Défense nationale.....	634	2,109	2,743	649	2,142	2,791
National Health and Welfare — Santé nationale et Bien-être social	155	162	317	204	196	400
National Research Council — Conseil national de recherches	719	1,914	2,633	774	1,998	2,772
Transport — Transports:						
Meteorological Branch — Direction de la météorologie	69	80	149	56	70	126
Other branches — Autres directions	24	22	46	33	22	55
Sub-totals — Totaux partiels	93	102	195	89	92	181
Veterans Affairs — Affaires des anciens combattants	33	44	77	30	38	68
Others — Autres	47	69	116	48	68	116
All departments and agencies — Total — Tous ministères et organismes	4,413	11,962	16,375	4,934	12,840	17,774

¹ Permanent staff plus seasonal and casual staff.

¹ Personnel permanent plus le personnel saisonnier et de service intermittent.

² Revised when necessary.

² Chiffres rectifiés au besoin.

TABLE 27. Engineers and Technologists of the Federal Government Engaged in R & D, by Field of Training, 1966-67

TABLEAU 27. Cadres techniques de l'administration fédérale affectés à la R & D, par domaine de formation, 1966-67

Department or agency — Ministère ou organisme	Aeronautical and aerospace — Aéronautique et aérospatial	Chemical — Chimique	Civil	Electrical and electronic — Électrique et électronique	Hydraulic — Hydraulique	Mechanical — Mécanique	Metal-lurgy and materials — Métallurgie et matériaux	Nuclear — Nucléaire	Other — Autres	Total
full-time equivalent — en équivalent de plein temps										
Atomic Energy of Canada Limited — L'Énergie atomique du Canada Limitée	9	67	28	66	—	134	24	19	50	397
Energy, Mines and Resources — Énergie, Mines et Ressources	—	23	38	8	—	11	10	—	28	118
Fisheries — Pêcheries	—	11	—	2	27	4	—	—	—	44
Forestry and Rural Development — Forêts et Développement rural	—	2	5	2	—	—	—	—	9	18
National Defence — Défense nationale	14	22	7	138	—	59	9	—	1	250
National Research Council — Conseil national de recherches	30	18	37	88	2	66	7	—	30	278
Transport — Transports	—	—	4	28	1	—	—	—	—	33
Other — Autres	—	2	5	8	—	3	—	—	—	18
All departments and agencies — Total — Tous ministères et organismes	53	145	124	340	30	277	50	19	118	1,156

TABLE 28. Scientists of the Federal Government Engaged in R & D, by Field of Training, 1966-67
TABLEAU 28. Cadres scientifiques de l'administration fédérale affectés à la R & D, par domaine de formation, 1966-67

Department or agency Ministère ou organisme	Astronomers — Astronomes	Chemists — Chimistes	Geologists and other solid earth scientists — Géologues et autres spécialistes des sciences de la terre	Mathematicians — Mathématiciens	Meteorologists and other atmospheric scientists — Météorologues et autres spécialistes des sciences de l'atmosphère	Oceanographers — Océanographes	Physicists — Physiciens	Agricultural scientists — Spécialistes des sciences agricoles	Biological scientists — Spécialistes des sciences biologiques	Medical scientists — Spécialistes des sciences médicales	Other — Autres	Total
full-time equivalent — en équivalent de plein temps												
Agriculture		14	—	—	—	—	—	892	1	—	—	907
Atomic Energy of Canada Limited — L'Energie atomique du Canada Limitée	—	55	1	17	2	—	93	3	3	5	54	233
Energy, Mines and Resources — Énergie, Mines et Ressources	24	87	285	7	1	93	94	—	1	—	73	665
Fisheries — Pêcheries	—	66	1	1	—	9	3	—	211	—	9	300
Forestry and Rural Development — Forêts et Développement rural	—	21	1	4	—	—	2	144	205	—	3	380
Indian Affairs and Northern Development — Affaires indiennes et Nord Canadien	—	—	—	—	—	—	—	—	78	—	—	78
National Defence — Défense nationale	—	79	6	39	—	—	202	3	30	15	25	399
National Health and Welfare — Santé nationale et Bien-être social	—	—	—	—	—	—	—	—	—	204	—	204
National Research Council — Conseil national de recherches	4	229	4	24	1	—	152	18	60	4	—	496
Transport — Transports	—	—	—	—	56	—	—	—	—	—	—	56
Veterans Affairs — Affaires des anciens combattants	—	1	—	1	—	—	—	—	—	28	—	30
Other — Autres	—	9	—	—	—	—	4	—	16	1	—	30
All departments and agencies — Total — Tous ministères et organismes	28	561	298	93	60	102	550	1,060	605	257	164	3,778

TABLE 29. Scientists and Engineers of the Federal Government Engaged in R & D, by Field and Level of Training, 1966-67
TABLEAU 29. Cadres scientifiques et techniques de l'administration fédérale affectés à la R & D, par domaine et degré de formation, 1966-67

Field of training — Domaine de formation	Bachelors — Bacheliers	Masters — Maîtres	Doctors — Docteurs	Total
full-time equivalent — en équivalent de plein temps				
Engineering and technology — Génie et technologie:				
Aeronautical and aerospace — Aéronautique et aérospatial	18	30	5	53
Chemical — Chimie	102	23	20	145
Civil	70	38	16	124
Electrical and electronic — Électrique et électronique	220	83	37	340
Hydraulic — Hydraulique	27	3	—	30
Mechanical — Mécanique	193	61	23	277
Metallurgy and materials — Métallurgie et matériaux	26	10	14	50
Nuclear — Nucléaire	3	7	9	19
Other — Autres	75	29	14	118
Sub-totals — Totaux partiels	734	284	138	1,156
Physical sciences — Sciences physiques:				
Astronomy — Astronomie	1	4	23	28
Chemistry — Chimie	171	64	326	561
Geology — Géologie	73	53	172	298
Mathematics — Mathématiques	40	30	23	93
Meteorology — Météorologie	17	35	8	60
Oceanography — Océanographie	28	32	42	102
Physics — Physique	155	124	271	550
Other — Autres	57	31	37	125
Sub-totals — Totaux partiels	542	373	902	1,817
Life sciences — Sciences de la vie:				
Agricultural sciences — Sciences agricoles	185	297	578	1,060
Biological sciences — Sciences biologiques	129	163	313	605
Medical sciences — Sciences médicales	90	47	120	257
Sub-totals — Totaux partiels	404	507	1,011	1,922
Other sciences — Autres sciences	21	8	10	39
Total	1,701	1,172	2,061	4,934

¹ Permanent staff plus seasonal staff.

¹ Personnel permanent plus le personnel saisonnier.

QUESTIONNAIRE

Complete in duplicate. Keep one copy for your files and return one copy in the enclosed envelope to the Dominion Bureau of Statistics, Ottawa

FOR IMMEDIATE ATTENTION

DOMINION BUREAU OF STATISTICS

Business Finance Division

**FEDERAL GOVERNMENT EXPENDITURES
ON SCIENTIFIC ACTIVITIES**

Fiscal Years 1966-67 and 1967-68

This survey, conducted in co-operation with the Science Secretariat, is intended to provide data for estimates of the magnitude and direction of the Federal Government's scientific programme.

All information collected in the survey, apart from the names of individual recipients of funds, may be published. Please indicate, in an accompanying letter, any data which your unit believes should not be published.

Please complete the questionnaire as fully as possible. If precise figures are not available, your best estimates will be satisfactory. Keep one copy of the completed form for your files and return one copy, within 8 weeks, to the Dominion Bureau of Statistics.

Address enquiries and requests for more forms to the Scientific Activities Surveys Section, Business Finance Division, Dominion Bureau of Statistics.

Name of reporting unit

Person making this report

Telephone

Date

GENERAL

Scientific activities include all activities in the engineering, life and physical sciences concerned with the creation or acquisition of new knowledge or new applications of knowledge to useful purposes. The activities of greatest interest are research and development, but the questionnaire also covers expenditures in the related areas of data collection, information dissemination, testing and standardization and support of professional training through scholarships and fellowships.

Routine applications of scientific knowledge are NOT included, except when these are related to the creation and promotion of new knowledge or applications. Activities in the social sciences are NOT included in this survey.

A. IDENTIFICATION OF FUNDS FOR SCIENTIFIC ACTIVITIES

SOURCE OF FUNDS	FUNDS	
	Actual expenditures 1966-67	Estimated expenditures 1967-68
	(thousands of dollars)	
1. Funds available as a result of annual estimates		
2. Cost of indirect support		
3. Transfers from other units of your dept. or agency (identify)		
.....		
.....		
4. Transfers from other depts. or agencies of the Federal Government (identify)		
.....		
.....		
5. Funds received from other sources (identify)		
.....		
.....		
Sub-totals		
Deduct		
6. Transfers to other units of your dept. or agency (identify)		
.....		
7. Transfers to other depts. or agencies of the Federal Government (identify)		
.....		
.....		
8. Support provided non-scientific activities		
Sub-totals		
TOTAL FUNDS AVAILABLE		

A. IDENTIFICATION OF FUNDS

Instructions

A1 - Funds available as a result of annual estimates - these are funds allotted to the department or agency by parliament. The 1966-67 expenditures would be the expenditures prepared for the Public Accounts by the department. The 1967-68 expenditures should be the sub-allotments when available, otherwise the estimates and supplementary estimates must be used.

A2 - Cost of indirect support - this is the total of the funds administered by other departments which are used to support your scientific activities. These funds will normally be included in the **estimates** in the section "Approximate Value of Major Services not included in these Estimates" which appears at the head of a department's detailed estimates. The supporting departments are usually Public Works, Finance, Labour and the Post Office.

A3 - Transfers from other units of your dept. or agency - these include all funds transferred from other units in support of your scientific activities. If this questionnaire is being completed at department or agency level this question is not applicable.

A4 - Transfers from other depts. or agencies - these are funds received for the scientific activities of your organization from other departments or agencies. Please give the F.E. number or other identification of individual transfers over \$50,000.

A5 - Funds received from other sources - these are mainly funds received as a result of sales or contracts and which are applied to the scientific activities of the unit, department or agency. Grants from foreign governments are also included.

A6, A7 - Transfers - all funds allocated to your organization which have been transferred to others within the Federal Government for scientific activities. Please give the F.E. number or other identification of individual transfers over \$50,000.

A8 - Support provided non-scientific activities - any portion of the funds shown in the answers to A1 to A5 which have been spent on non-scientific activities must be included here.

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

TYPE OF SCIENTIFIC ACTIVITY	PERFORMERS						TOTAL
	Reporting unit	Canadian profit organizations	Canadian educational institutions	Canadian non-profit institutions	Other Canadian	Foreign	
Actual expenditures 1966-67							
1. R & D costs (intra-mural and contracts)							
2. Grants-in-aid of R & D							
Sub-totals							
3. Capital expenditures on R & D plant....							
4. Capital expenditures on plant for other scientific activities							
5. Scientific data collection							
6. Scientific information							
7. Testing and standardization							
8. Scholarship and fellowship programs							
TOTAL EXPENDITURES							
Estimated expenditures 1967-68							
1. R & D costs (intra-mural and contracts)							
2. Grants-in-aid of R & D							
Sub-totals							
3. Capital expenditures on R & D plant....							
4. Capital expenditures on plant for other scientific activities							
5. Scientific data collection							
6. Scientific information							
7. Testing and standardization							
8. Scholarship and fellowship programs							
TOTAL EXPENDITURES							

B. PERFORMERS OF SCIENTIFIC ACTIVITIES

Instructions

B.1 R & D—scientific research and development. Research is investigative, experimental and generally original work undertaken primarily for the advancement of scientific knowledge. There may, or may not, be a specific practical application in view.

Development is the use of the results of research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. It includes the design, construction and testing of pilot plants and prototypes.

More extensive notes on research and development are included in the definitions of Question C.

Expenditures are current operating costs and contracts, including the costs of planning and administering R & D contracts.

B.2 Grants in aid of R & D—payments made in support of R & D performed outside the reporting unit. Normally the grantor is not purchasing whatever information or device which may result from the R & D but intends to encourage the performance of research or development with a view to developing the capabilities of the grantee. In some cases the performer may even reimburse the grantor. The criterion should be the intention of the grantor rather than the name of the funding programme. For example, "fellowships" designed to support the research of graduate students instead of their education should be considered grants. Similarly, "contracts" with industrial firms under P.A.I.T. are considered to be grants since the intention is to improve the technological capabilities of the recipient.

The costs of administering grant programmes are to be included, normally in the column "Reporting unit".

B.3 Capital expenditures on R & D plant—expenditures on land, buildings, non-expendable research equipment and facilities (e.g. research satellite launch facilities, research ships) used for R & D. In the case of multi-purpose plant, for example a ship used for oceanographic research and also for surveying, the capital R & D expenditures should be based on the proportion of plant (or its operating time) used for R & D.

B.5 Scientific data collection—the collection and arrangement of scientific data on natural phenomena. Includes geologic, hydrologic, geo-magnetic, meteorologic, topographic, astronomic and other physical data as well as biologic, entomologic, zoologic, and other data in the life sciences. **Exclude** data collection done in the course of research as this activity is included in the performance of the research. Also exclude the collection of data done solely for internal administrative purposes.

The presentation of these data in reports, maps and other publications is included in scientific information.

B.6 Scientific information—the dissemination of information resulting from scientific activities. Costs include the operation of libraries of scientific and technical publications; procurement, translation and publication of scientific information; standardization of terminology; composition of exhibits and films; and the support, including travel allowances, of scientific conferences and symposia.

B.7 Testing and standardization—the establishment of national standards for materials, devices, products and processes; the testing required in connection with such standards; and non-routine quality testing separately identifiable from R & D which is required to identify the characteristics of materials, devices, products and processes in view of the particular interests of individual organizations.

B.8 Scholarship and fellowship programmes—grants to individuals or institutions intended to support the training and education of students in the engineering, physical and life sciences. The costs of administering such programmes should be included, normally in the column "Reporting unit".

Reporting unit—any department or agency, or unit of a department or agency, for which a questionnaire is completed.

Canadian profit organizations—Canadian business enterprises, research institutions and trade associations operated by industries for their own benefit, public utilities and other commercial-type corporations owned by Canadian governments.

Canadian educational institutions—Canadian universities and colleges, including medical schools but excluding attached hospitals, which are covered in Canadian non-profit organizations.

Canadian non-profit organizations—Canadian institutions, foundations and societies which support some scientific activity and are not primarily designed to make a profit or to provide profit organizations with research results. Hospitals, voluntary health organizations and scientific societies are included.

Other Canadian performers—provincial research councils or foundations and units of provincial or municipal governments receiving funds for scientific activities.

General

(a) The row total of the "Total" column must equal the "Total funds available" of Question A for each year.

(b) Funds appearing in A2 "Cost of indirect support" may be distributed only in the "Reporting Unit" column.

(c) If you are aware that a recipient of funds did not perform the activity but allocated funds to another performer, please complete the question for the ultimate performer.

(d) List all performers of extra-mural R & D on the enclosed annex.

C. FIELD OF RESEARCH AND DEVELOPMENT

Scientific field	1966-67 (actual)				1967-68 (estimated)			
	Current intra-mural expenditures		Total current expenditures		Current intra-mural expenditures		Total current expenditures	
	Basic research	Applied research	Development	Basic research	Applied research	Development	Basic research	Development
Engineering and technology:								
Aeronautical and aerospace								
Chemical								
Civil								
Electrical and electronic								
Forestry								
Hydraulic								
Mechanical								
Metallurgy and materials								
Mining								
Nuclear								
Other (identify)								
TOTALS, ENGINEERING AND TECHNOLOGY								
Physical sciences:								
Astronomy								
Chemistry								
Earth sciences:								
Geology and other solid earth sciences								
Meteorology and other atmospheric sciences								
Oceanography								
Mathematics								
Physics:								
Atomic and molecular physics								
Nuclear physics								
Solid state physics								
Other physics								
Other (identify)								
TOTALS, PHYSICAL SCIENCES								
Life sciences:								
Agricultural sciences								
Biological sciences								
Medical sciences								
TOTALS, LIFE SCIENCES								
TOTALS, ALL FIELDS OF SCIENCE								

C. FIELD OF RESEARCH AND DEVELOPMENT

Instructions

Scientific field—the sciences or types of engineering in which the research or development is being performed. In cases of projects involving several disciplines, estimation of the expenditures in each scientific field could be based on some criterion such as the number of scientists and engineers working in each field. The sciences and types of engineering or technology are not mutually exclusive. Research or development in an "end oriented" field of science may require work in a more "matter oriented" field. For example, R & D in agricultural sciences may require research in chemistry and biology. In cases of such conflict between two listed sciences, assign expenditures to the science of application—in the example above this would be the agricultural sciences. There are also many interdisciplinary sciences such as astrophysics, geophysics, pharmacology, etc. In these cases, also assign expenditures to the science of application. Thus expenditures in the three examples above should be entered as astronomy, solid earth sciences and medical sciences.

Agricultural sciences—sciences concerned with understanding and improving plants and animals which may be raised by man.

Biological sciences—sciences concerned with understanding and manipulating living things, except in their agricultural or medical aspects.

Medical sciences—sciences concerned with understanding and controlling human health and diseases.

Basic research—work undertaken primarily for the advancement of scientific knowledge, without a specific practical aim in view. "Oriented" basic research, which is fundamental research required in some area to permit further technological or scientific advances, is also included.

Applied research—work undertaken primarily for the advancement of scientific knowledge, but with a specific practical aim in view.

Practical distinctions between basic and applied research may be based on the aim, the method and the results of the research.

The aims of basic and applied research are different. The aim of basic research is to satisfy curiosity or to extend theoretical knowledge either in general or in some particular field, the object of applied research is to solve a particular problem, to improve an existing product or process or to enable a discovery or existing knowledge to be used in a specific situation or area.

The methods of research will often be different. In basic research the investigators will be less restricted in the subject and direction of their work than will be the case in applied research. Basic research may be conducted as an individual project rather than a group project oftener than in the case in applied research.

The results of the two types of research may well be different. The findings of a basic research project are more likely to have a broad, fundamental significance. They may lead to a multiple number of applications, whereas the results of applied research will often be of use only to a particular area or project.

Development—the use of the results of fundamental and applied research, directed to the introduction of useful materials, devices, products, systems and processes, or to the improvement of existing ones. Difficulty is often experienced in distinguishing between development and production costs.

The criterion must be the reason for which the work is undertaken. If the primary aim is to improve the quality of the product or process, the relevant expenditures are for development. If the primary motive is to get the production process set up, the work is NOT development.

The design, construction and testing of prototypes is R & D, but the costs of trial production runs are NOT development costs. After an original prototype has been successfully tested and no more development work is required, limited scale manufacture of the item, even though they may still be called "prototypes", cannot be included in development.

The costs of changes in design made necessary because of changed fashions or styles unaccompanied by technological innovation is NOT R & D.

Once the experimental phase of a pilot plant is over, it may be operated as a productive unit. As soon as the primary purpose in operating a pilot plant is for production, the costs of operation may no longer be attributed to development.

Current intra-mural expenditures—the sum of current intra-mural expenditures for basic research, applied research and development is equal to the amount shown in the cell formed by row B.1 and column "Reporting Unit" of Question B, less the costs of administering any R & D contracts.

Total current expenditures—the sum of the figures entered in the total current expenditures section must equal the sum of the amounts shown in rows B.1 and B.2 of Question B.

D. GENERAL AREA OF APPLIED RESEARCH AND DEVELOPMENT

AREA	ACTUAL EXPENDITURES 1966-67		ESTIMATED EXPENDITURES 1967-68	
	%	Amount (thousands of dollars)	%	Amount (thousands of dollars)
Nuclear science				
Space travel and communications				
Military science				
Other:				
Agriculture, fishing and forestry				
Construction and building				
Transportation: roads and bridges, merchant marine, civil aviation and meteorology				
Telecommunications				
Health and hygiene				
Industry, including mining				
Research on behalf of underdeveloped areas				
Other (please specify)				
.....				
TOTAL CURRENT EXPENDITURES ON APPLIED RESEARCH AND DEVELOPMENT				

INSTRUCTIONS

Totals — must equal the sum of all **total current expenditures** on applied research and development entered in Question C.

Nuclear science — enter all expenditures in this area, including those for work with military, medical or industrial applications.

Space travel and communications — enter all expenditures in this area, including those for work with military or industrial applications.

Military science — enter all expenditures in this area except those considered to be for R & D in Nuclear science or Space travel and communications.

Industry — enter all expenditures for applied research and development expected to benefit industrial technology and which have not been assigned to specific areas listed in this question.

Research on behalf of underdeveloped areas — enter expenditures for applied research and development undertaken with a view to understanding, adapting or utilizing areas with climatic or geological characteristics which so far have hindered effective exploitation.

E. PERSONNEL EMPLOYED IN R & D (SUMMARY)

	Total number employed	Full-time equivalent
1. Employed as of 31 March 1967:		
(a) Scientists and engineers:		
Bachelors.....		
Masters.....		
Doctors.....		
Total.....		
(b) Supporting personnel:		
Technicians.....		
Other.....		
Total.....		
(c) TOTAL PERMANENT STAFF		
2. Seasonal or casual staff:		
(a) Scientists and engineers:		
Bachelors.....		
Masters.....		
Doctors.....		
Total.....		
(b) Supporting personnel:		
Technicians.....		
Other.....		
Total.....		
(c) TOTAL SEASONAL OR CASUAL STAFF		
3. TOTAL STAFF		

INSTRUCTIONS

Personnel employed in R & D - all persons engaged in the performance, administration or close support of research and development. The wages and salaries of these persons have been entered in Question B (rows B.1 and B.2, column "Reporting unit"). DO NOT include persons engaged full-time in other scientific activities.

Total number employed - all persons on the permanent staff as of 31 March 1967 who were employed in R & D during the year 1966-67 and all seasonal or casual staff working for the reporting unit during 1966-67 or a portion of 1966-67 who were employed in R & D during the year.

Full-time equivalent - the amount of time, in man-years, spent by persons in each class on R & D. For example, a person on permanent staff who worked only on R & D is a F.T.E. of 1; a person on permanent staff who worked on R & D about 50% of the time is a F.T.E. of 0.5; a seasonal worker, employed for 4 months, who worked only on R & D is a F.T.E. of 0.3; a seasonal worker, employed for 4 months, who worked on R & D about 50% of the time is a F.T.E. of 0.2.

Technicians - graduates of institutes of technology, holders of certificates from professional associations or experienced personnel in technician job positions who assist scientists and engineers in R & D.

Other supporting personnel - persons who are not scientists, engineers or technicians but are engaged in the performance, administration or close support of R & D. For example: apprentices, clerical staff, machine operators, labourers, librarians and purchasing officers.

E. PERSONNEL EMPLOYED IN R & D (DETAIL)

Field of training	Bachelor	Master	Doctor	Total number employed	Full-time equivalent
Engineers and technologists:					
Aeronautical and aerospace					
Chemical					
Civil					
Electrical and electronic					
Forestry					
Hydraulic					
Mechanical					
Metallurgy and materials					
Mining					
Nuclear					
Other (identify)					
TOTALS, ENGINEERS AND TECHNOLOGISTS					
Physical scientists:					
Astronomers					
Chemists					
Earth scientists:					
Geologists and other solid earth scientists					
Meteorologists and other atmospheric scientists					
Oceanographers					
Mathematicians					
Physicists					
Other (identify)					
TOTALS, PHYSICAL SCIENTISTS					
Life scientists:					
Agricultural scientists					
Biological scientists					
Medical scientists					
TOTALS, LIFE SCIENTISTS					
Other fields of training (identify)					
TOTALS, OTHER FIELDS					
TOTALS, ALL PROFESSIONAL PERSONNEL					
Professional personnel employed as administrators of R & D					

INSTRUCTIONS

Field of training – the scientific field in which the professional worked for his last degree,

Totals of professional personnel – the totals for bachelors, masters, doctors, number employed and full-time equivalent must correspond to the sum of the entries in Question E on p. 9 for permanent and seasonal scientists and engineers (total of 1(a) and 2(a)).

Administrators of R & D – university graduates, normally scientists and engineers with R & D experience, engaged in the immediate administration and direction of R & D programmes. University graduates engaged in the support administration of organizations having R & D functions should be considered as "Other supporting personnel." Administrators are shown twice in this table: once for their field of training and once as administrators.

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